

R. C. Patel Educational Trust's **R. C. Patel Arts, Commerce and Science College Shirpur-425405,** Karvand Naka, Dist.- Dhule (Maharashtra) E-mail - principal@rcpasc.ac.in

Affiliated to: K. B. C. North Maharashtra University, Jalgaon-425001

Self Study Report (SSR): 2024 (4th Cycle)



Criteria - 1 Curricular Aspects

Key Indicator – 1.2 Academic Flexibility

Metric No. - 1.2.1 (QnM)

Number of Certificate/Value added courses offered and online courses of MOOCs, SWAYAM, NPTEL etc. where the students of the institution have enrolled and successfully completed during the last five years)

Submitted to

National Assessment and Accreditation Council, Bangalore



Date: 15/06/2024

Declaration

This is to declare that, the information, reports, true copies of the supporting documents, numerical data etc. submitted in these files is verified by Internal Quality Assurance Cell (IQAC) and it is correct as per the office record.

This declaration is for the purpose of NAAC accreditation of the HEI for the 4th cycle assessment period 2018-19 to 2022-23.

Place: Shirpur

Date: 15/06/2024

Dr. Sandip P. Patil IQAC Co-ordinator IQAC Coordinator R. C. Patel Educational Trust's R. C. Patel Arts, Commerce and Science College Shirpur, Dist.-Dhule (M.S.) 425405



Dr. D. R. Patil IQAC Chairman & Principal PRINCIPAL R. C. Patel Educational Trust's R. C. Patel Arts, Commerce and Science College Shirpur, Dist.-Dhule (M.S.) 425405

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K.B.C. North Maharashtra University, Jalgaon

Ordinance 181

College Name:

R. C. Patel Arts, Commerce and Science College, Shirpur

Certificate course in Commerce for Textile Industry

> Faculty SCIENCE AND TECHNOLOGY

> > (2018-19)

Syllabus

Level of diploma	Graduate diploma
Eligibility	As per ordinance 181
Duration	1 Year
Total Credits	20 Credits

Course Structure

Pape rNo.	Old Subject Name	New Subject Name	Credits
CT 101	Fundamental of Computer	Basics of Computer	6 Credits
CT 102	Communicative English	Business Communication	6 Credits
CT 103	Industrial visit Project viva	Project	8 Credits

Topics	Lectures Allotted (in hrs.)
1.Introduction to computer system Definition of computer, History of computersBlock Diagram of Computer, Types of computer, Neumann machineInput Devices: Keyboard, Mouse, Scanner 1.4 Output Devices: Monitor,Printer, PlotterMemory: Primary Memory, RAM, ROM, EPROM, PROM,Secondary Memory, Hard Disk, Pen DriveDefinition: Data, Information, Algorithm, Flowchart, Program,Hardware, And Software: System Software, Application, Software,Firmware, Interpreter, compilerProgramming Languages: High level, Middle Level, Low Level	22
2.Introduction CPU parts Motherboard, SMPS,USB device	10
3.Operating system WINDOWS 7, Ubuntu, Linux	8
4.Internet and networking LAN, WAN, MAN, WWW and MODEM	10
5.Applications Word Processor, spreadsheets, database management software, Multimedia development software (Internet)	10
6.Introduction to flow chart, Define symbols of flowchart, Examples	10
7. Computer Virus Computer Virus: Indication of virus infection Types of Viruses: Boot Sector Virus, Programs Virus, Macro Virus, Multipartite Virus, Polymorphic Virus, Worms, Malware: Spyware, Adware, Anti-Virus Computer Ethics: Hacking, Software Piracy, Spamming, Phishing	10
8.Windows Operating Environment Features of MS – Windows, Control Panel, Taskbar, Desktop, Windows Application, Icons, Windows Accessories, Notepad, Paintbrush.	10
Total	90

CT101 – Basic Computing

CT 103: Project

(Total lecture allotted 120)

Visit and Study any corporate office/department (textile industry) and Preparestudy report on it. Group size is maximum 2 students

Note-The student has to write a report based on the actual work undertaken during the industrial visit at the specific selected enterprise/ organization or sub system and get it certified by the concerned teacher that the Project report has been satisfactorily completed and submit TWO typed copies of the same to the co-coordinator of the certificate course.

Suggested Reading

- 1. Fundamentals of computers :V. Raja Raman
- 2. Computer Fundaments: P.K. Sinha
- 3. Computer Fundamentals (Architecture and Organization) -B. Ram
- 4. Microsoft Office 2000 Vipra Computers
- 5. Digital Fundamentals Floyd
- 6. Digital Principles and Applications A. P. Malvina & D.P.Leach (TMH)
- 7. Communication skills : C. B. Gupta
- 8. Business English :Department of English University of Delhi

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R. C. Patel. A. C. S. College, Shirpur Certificate Course in Commerce for Textile Industry 2018-2019 Attendance sheet



R. C. Patel Educational Trust's

R. C. Patel Arts, Commerce & Science College, Shirpur (Affiliated to the K.B.C. North Maharashtra University, Jalgaon)

STATEMENT OF MARKS

Certificate in Commerce for Textile Industry (CGPA Pattern) Examination held in May 2019

Student Name : Nikum Shubhangi Sanjay

College Name : R. C. Patel Arts Commerce and Science College, Shirpur

Seat Number : 909999

Exam Centre : Shirpur (240051)

Paper Code	Paper Name	AM	Credits (Max.)	Marks Obtained
CCCTI 101	Basics of Computer	ТН	6.0	86
CCCTI102	Communication English	TH	6.0	82
CCCTI 103	Lab Course	PR	8.0	82

Result: Pass

Grade: A

Co-ordinator

Abbreviations:

AM: Assessment Methods, P: Pass, F: Fail, AB: Absent, RR: Result Reserved, TH: Theory, PR: Practical, O: Outstanding Grade

CGPA: 5.25



R.C.Patel Arts, Commerce & Science College, Shirpur Department of History Certificate Course in Cultural Heritage of India 2018-2019

Aim

✓ Cultural Heritage is a concept which offers a bridge between the past and the future with the application of particular approaches in the present. Due to its attached values for these groups or societies, cultural heritage is maintained in the present and bestowed for the benefit of future generations.

Course Objective

- ✓ To introduce the Cultural heritage of India
- \checkmark Aware the importance and legacy of caves, forts, Fairs and festivals.
- ✓ To develop the interest and skill of tourism among the Student.

Course Outcomes

- ✓ Understand the Concept of Cultural Heritage of India.
- \checkmark Study the various Cultural factors which influence the rich flow of Indian Culture.
- ✓ Appreciate & Adequate the rich Cultural heritage of India.

Duration of the course

✓ One week A Certificate Course in Commerce Textile Industry

Timing of the course

✓ Two Houses a day.

Eligibility Criteria

For BA/B.Sc./B.Com Student

Criteria for completion

✓ The student must have attended at least 80% of the lectures and completed all assignment

Certificate Course in Cultural Heritage of India Syllabus

Total period:-15

Credits:-02

1 Culture Heritage: An Introduction

- a Definition and meaning of culture and heritage
- b Geographical features of India
- c Social Consequences of Saint of India
- d Characteristics of Indian Culture -

Continuity and Change, Variety and Unity, Secular Outlook. Universalism, Materialistic and Spiritualistic

2 Cultural Heritage of India

- a Caves and forts in India –Karle Caves, Bhaje Caves, Pandeva Caves,
 Pitalkhore Caves, Kanheri Caves Raigad, Pratapgad, Sinhagad, Shivneri,
 Daulatabad, Janjira
- b India Festivals and Pilgrimages

Gudi Padwa, Pola, Dussehra, Diwali, Holi, Rath Festival, Navratri Festival, Bhaldev, Gulabai Festival, Kanbai Festival, Shiv Jayanti Festival, Ganesh Festival, Jyotirlinga, Ashtavinayak, Shaktipeetha, Pandharpur

c World Heritage Sites in India

Ellora Caves, Elephanta Caves, Ajanta Caves, Victorian and Art Deco Ensemble of Mumbai, Chhatrapati Shivaji Maharaj Terminus

d Tour Report

Reference Book

- Pathak, A.S. (Edi 2009) Maharashtra: Land and its People, Gazetteers Department, Government of Maharashtra, Mumbai
- Karve Iravati (1951) Marathi Lokanchi Sanskrit, Deshmukh & Company, Pune
- The Cultural Heritage of India, Ramkrishana Mission Institute of Culture (9 Vol)

Admission Form

R.C.Patel Educational Trust's

R.C.Patel Arts Commerce and Science College Shirpur, Dist-Dhule, M.S. 425405

то,

The Principal R.C.Patel Arts, Commerce and Science College, Shirpur

Sir,

I wish to get admitted to as Students for the -

12 Marks obtained (out of total marks) : 68%

Certificate Course on Cultural Heritage of India

	PERTI	ICULAR OF CANDIDATE
1	Name in Full (Surname First)	: Pawara Priti Darasing
2	Father/Husband Name	: Pawara Darasing Ratnya
3	Mother Name	: Pawara Devakibai Daracing
4	Address for Correspondence	: Darbadya Tal. Shinpur
5	Mob. No.	: 9421188290
6	Email Id	: polpawara720@gmail.com
7	Date of Birth	1/611557
8	Place of Birth	Durbadya
9	Category	ST
10	Family Annual Income	: 500001-
11	Last qualified examination	: 12th Art

I hereby declare that all statements made in this application to the best of my knowledge and beliefs are true, complete and correct. I understand that in the event of any information being found fouls of incorrect, my admission is able to be cancelled.

Date 18/12/2018	Signature	- PDP
PlaceShirpur	Name of Student	- Pawara Prili Darasing

Year of Course 2018-2019

Course Name: - Certificate Course on Cultural Heritage of India

Sr.	Student Name	Signature of Beneficial Student									
No	Student Maine	7/1/2019	8/1/2019	9/1/2019	10/1/2019	11/1/2019	12/1/2019	14/1/2019			
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Student Attendance with Signature

R Dr. R.A.Chaudhari (Co-ordinator)



Dr. D.R.Patil (Principal)

R.C.Patel Art's Commerce and Science College, Shirpur

STATEMENT OF MARKS

Cultural Heritage of India

Examination held in 2019

Name	÷	Pawara Priti Darasing
Name of the College	:	R.C.Patel Arts Commerce and Science College, Shirpur
Seat number		07

Paper Code	Paper Name	AM	Marks	Total Marks	Grade
CHM 01	Cultural Heritage of India	TH	53	91	A
CHM 02	Field Work - Tour Report	PR	38	~	A

Result: Pass

12 Dr. R.A.Chaudhari (Co-ordinator)



Dr. D.R.Patil (Principal)

R.C.Patel Educational Trust's

R.C.Patel Arts Commerce and Science College Shirpur, Dist-Dhule, M.S. 425405

Cultural Heritage of India Tour Report - Manday Fort

Visits are always beautiful and fill a person's mind with joy and enthusiasm. But if that visit is educational, learning based, that provides us invaluable knowledge as well. On 20 January 2019, the History Department organized such an education tour. Madhya Pradesh Mandavgarh is a historical place 160 km from Shirpur city. Seeing the magnificent historical buildings and monuments here, we felt like we were in the historical times.

History of Mandav Fort Prof. Dr. Ramakant Chaudhari sir told us. He said that, Mandu was founded in the 10t^h century as the fort capital of the Parmar rulers of Malwa. It was subsequently occupied by a succession of Mughal rulers in the 15th and 16th centuries. The Mughals set up their indulgent kingdom there, resplendent with exquisite lakes and palaces. Mandu was invaded and captured by Mughal Emperor Akbar in 1561, and then taken over by the Marathas in 1732. The capital of Malwa was moved to nearby Dhar, and the decline of Mandu's fortunes began.

Mandu is perhaps most famous for the tragic tale of its last independent ruler, Mughal Sultan Baz Bahadur. He fell in love with a beautiful Rajput Hindu singer called Roopmati and persuaded her to marry him. She agreed on the condition that he would build her a magnificent palace (now known as Roopmati's Pavilion) from where she'd be able to see and offer prayers to the holy Narmada River. The sultan spent so much time with Roopmati that he neglected his kingdom and fled when Mandu was attacked by Emperor Akbar. Legend has it that he left Roopmati behind, and she choose to kill herself instead of being taken by the enemy.

The importance of Mandu's heritage and the consistent efforts being made to preserve it have been acknowledged. In September 2018, the Indian government jointly named Mandu as Best Heritage City in India at its 2016-17 National Tourism Awards.

Throughout the day, various historical structures and monuments of Mandavgada were visited and photos were also taken. This historic visit gave us the knowledge of the history and culture of Mandavgada.

Signature - PDP Name of Student - Pawara Pniti Darasing









R. C. Patel Educational Trust's

R. C. Patel Arts, Commerce & Science College, Shirpur

(Affiliated to the K.B.C. North Maharashtra University, Jalgaon)

STATEMENT OF MARKS

Certificate Course Name - Cultural Heritage in India

Examination held in - May 2019

Student Name : Pawara Priti Darasing

College Name : R. C. Patel Arts Commerce and Science College, Shirpur

Seat Number : 20182007

Exam Centre : Shirpur (240051)

Paper Code	Paper Name	AM	Marks (Max.)	Total Marks	
CCCHI 101	Cultural Heritage in India	TH	50	47	
CCCHI 102	Field Work	FW	50	48	

Result: Pass



Grade: O

Co-ordinator

Abbreviations:

AM: Assessment Methods, P: Pass, F: Fail, AB: Absent, RR: Result Reserved, TH: Theory, PR: Practical, O: Outstanding Grade

K.B.C. North Maharashtra University, Jalgaon

Advance Diploma in PLANT TISSUE CULTURE

Run by

R. C. Patel A. C. S. College, Shirpur

Under ordinance 181

Syllabus

A.Y-2018-19

Level of diploma	Graduate diploma
Eligibility	As per ordinance 181
Duration 1 Year	
Total Credits	20 Credits

ADPTC 101: Plant Tissue Culture and rDNA Technology

1. Mitochondrial and Chloroplast Engineering	15
1.1 Chloroplast engineering: Brief account	
1.2 Design of vectors for chloroplast transformation	
1.3 Mitochondrial transformation	
1.4 Applications and limitations of chloroplast and mitochondrial engineering	
2. Plant transformation and marker genes	15
2.1 Antibiotic resistance genes- Neomycin phosphotransferase II (npt-II gene), Hygromycinpho sphotransferase (hpt-gene)	
2.2 Antimetabolite marker gene- Dihydrofolate reductase gene	
2.3 Herbicide resistance markers- Phosphinotricin acetyltransferase	
3. Marker free transgenic Plants	15
3.1Reporter gene- Opine synthase, β- glucouronidase, green fluroscent protein, bacterialluciferase gene	
3.2 Production of marker free transgenic plant	
3.3 Clean gene technology	
4. RDNA technology 15	
4. RDNA technology 15	
4. RDNA technology 15 4.1 Benefits of transgenic crops	
4. RDNA technology154.1 Benefits of transgenic crops4.2 Insect resistance plants through transgenic approach	15
4. RDNA technology154.1 Benefits of transgenic crops4.2 Insect resistance plants through transgenic approach4.3 Herbicides resistance plants through transgenic approach	15
4. RDNA technology154.1 Benefits of transgenic crops4.2 Insect resistance plants through transgenic approach4.3 Herbicides resistance plants through transgenic approach5. Recombinant DNA technology in plants improvement	15
 4. RDNA technology 15 4.1 Benefits of transgenic crops 4.2 Insect resistance plants through transgenic approach 4.3 Herbicides resistance plants through transgenic approach 5. Recombinant DNA technology in plants improvement 5.1 Resistance genes from microorganisms- Bt- toxins 	15
 4. RDNA technology 15 4.1 Benefits of transgenic crops 4.2 Insect resistance plants through transgenic approach 4.3 Herbicides resistance plants through transgenic approach 5. Recombinant DNA technology in plants improvement 5.1 Resistance genes from microorganisms- Bt- toxins 5.2 Resistance gene from higher plant- Proteinase inhibitors 	15
 4. RDNA technology 4.1 Benefits of transgenic crops 4.2 Insect resistance plants through transgenic approach 4.3 Herbicides resistance plants through transgenic approach 5. Recombinant DNA technology in plants improvement 5.1 Resistance genes from microorganisms- Bt- toxins 5.2 Resistance gene from higher plant- Proteinase inhibitors 5.3 Virus resistance- coat protein mediated cross protection 	
 4. RDNA technology 15 4.1 Benefits of transgenic crops 4.2 Insect resistance plants through transgenic approach 4.3 Herbicides resistance plants through transgenic approach 5. Recombinant DNA technology in plants improvement 5.1 Resistance genes from microorganisms- Bt- toxins 5.2 Resistance gene from higher plant- Proteinase inhibitors 5.3 Virus resistance- coat protein mediated cross protection 6. Transgenic plants as bioreactor 	

- 1. Introduction to plant biotechnology H. S. Chawla, III Edn, Oxford and IBH Publ.
- 2. Biotechnology, U Satyanarayana, Books and allied (P) Ltd
- 3. Plant tissue culture, Sunil Kumar and M P Singh, APH Publ.
- 4. Biotechnology-Tissue culture to proteomics, P C Trivedi, Pointer Publ.
- 5. Purohit S.S.(2002), Agricultural Biotechnology, Agrobios India, Jodhpur
- De K.K.,(1998) An introduction to Plant Tissue Culture, New central book agencyPvt.Ltd,Calcutta
- Bhojwani S. S. and Razdan M.K. (1983) Plant tissue culture theory and practice, Elsevier SciencePub., Amsterdam.

ADPTC 102: Applied Plant Tissue Culture	
1. Tissue Culture and Crop Improvement	15
1.1 Micro propagation	
1.2 Virus irradiation	
1.3 Germplasm exchange	
2. Cost Cuttings in Tissue Culture	15
2.1 Low cost option for culture media	
2.2 Low cost option for bioreactor	
2.3 Low cost option for energy	
3. Horticulture and Floriculture Biotechnology	15
3.1 Concept of horticulture	
3.2 Techniques in horticulture	
3.3 Floriculture production through genetic modification	
4.Edible vaccines	15
4.1 Introduction and history	
4.2 Criteria for selection of plants as a vaccine	
4.3 Designing genes for insertion	
5. Food Safety	15
5.1 Transformed tissue culture and food safety	
5.2 Quarantine checking	
5.3 Challenges and issues	
5.4 Food security	
6. Intellectual Property Rights	15
6.1 Forms of protection: Copyright, Trademarks	
6.2 Patent: Patent application	
6.3 Patenting of biological material: Microorganisms, plant, animal	

- 1. Introduction to plant biotechnology H. S. Chawla, III Edn, Oxford and IBH Publ.
- 2. Plant tissue culture, Sunil Kumar and M P Singh, APH Publ.
- 3. Biotechnology-Tissue culture to proteomics, P C Trivedi, Pointer Publ.
- 4. Plant tissue culture, Rajender Singh, ALP Books.
- 5. Tissure culture, Rajendra Reddy, J P Abhay Shankar, CommonWealth Publ.
- 6. Ramawat K.G. (2004), Plant Biotechnology, S.Chand and Company Ltd., New Delhi.

ADPTC 103: Practical Course

Sr. No.	Practical name	Lecture Allotted
1.	Safety aspects in PTC lab	15
2.	Production of synthetic seeds from somatic embryo	18
3.	Isolation of chloroplast DNA	15
4.	Isolation of mitochondrial DNA	15
5.	Extraction of RNA from leaf tissue	15
6.	Study of root culture	15
7.	Study of another culture	15
8.	Study of mitosis in onion root tip	12
	Total	120

- 1. Biotechnology procedures and experiments handbook, S.Harisha
- 2. Plant tissue culture, Kaylan Kumar De, New central book agency Pvt.Ltd., Calcutta
- Aneja K.R. (1998), Experiments in Microbiology, Plant pathology, Tissue culture and Mushroomcultivation, Vishwa Prakashan, New age international (p) Ltd., New Delhi
- 4. Schmauder Hans Peter (1997), Methods in Biotechnology, Taylor and Francis, London.
- 5. Schuler M. A. and Zielinski R. E. (1989), Methods in Plant Molecular Biology.
- Vyas S.P. and Kohli D.V. (2002), Methods in Biotechnology and Bioengineering, CBSPublishers and Distributors, New Delhi.

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Lecture attendance Advanced Diploma in Plant Tissue Culture 2018-19	



R. C. Patel Educational Trust's

R. C. Patel Arts, Commerce & Science College, Shirpur (Affiliated to the K.B.C. North Maharashtra University, Jalgaon)

STATEMENT OF MARKS

Advanced Diploma in Plant Tissue Culture (CGPA Pattern)

Examination held in May 2019

Student Name : Deshmukh Parth Jitendra

College Name : R. C. Patel Arts Commerce and Science College, Shirpur

Seat Number : 192205

Exam Centre : Shirpur (240051)

Paper Code	Code Paper Name DPTC 101 Plant tissue culture and rDNA technology		Credits (Max.)	Marks Obtained
ADPTC 101	Plant tissue culture and rDNA technology	ТН	6.0	85
ADPTC 102	Applied Plant tissue culture	тн	6.0	81
ADPTC 103	Lab course	PR	8.0	86

 Result: Pass
 CGPA: 5.45
 Grade: A

 Grade: A
 Grade: A
 Grade: A

 Abbreviations:
 Co-ordinator

 AM: Assessment Methods, P: Pass, F: Fail, AB: Absent, RR: Result Reserved, TH: Theory, PR: Practical, O: Outstanding Grade
 F: Fail, AB: Absent, RR: Result Reserved, TH: Theory, PR: Practical, O: Outstanding Grade

K.B.C. North Maharashtra University, Jalgaon Certificate course in BIOINFORMATICS

Run by

R. C. Patel A. C. S. College, Shirpur

Under ordinance 181

Syllabus

w. e. f. 2018-19

Level of diploma	Graduate diploma							
Eligibility	As per ordinance 181							
Duration	1 Year							
Total Credits	20 Credits							

Course Structure

CCBI 101	Fundamentals of Biology	6 Credits
CCBI 102	Introduction to Bioinformatics	6 Credits
CCBI 103	Lab course	8 Credits

Topics	Lectures allot
	(in hrs)
 Vital aspects of life Basic properties of life, Basic chemistry, pH, concept of acids, bases Prokaryotic and eukaryotic cells- Structure and functions of various cell organelles 	15
Concepts of chemistry	
• Elements and atoms	
• Molecules and compounds, types of bonds	15
Water and its properties	15
• Bioenergetics: Laws of Thermodynamics and its Applications; Concept of free energy, Gibbs free energy.	
Introduction to living forms	
• Characteristics of life, the tree of life	
Animal kingdom – General properties	
Plant kingdom– General properties	
Microorganisms (bacteria, algae, fungi, protozoa and viruses)Morphology and ultra-structure of bacteria	25
Concept of growth and different growth phases of bacteriaMicrobial growth	
• Kinetics of growth	
Concept of biomolecules	
• Carbohydrates: definition, properties of monosaccharide, disaccharide and polysaccharides	
• Lipids: biological significance, classification (simple, compound and derived lipids)	
• Amino acids: definition, physical and chemical properties of amino	
acids, classification, structure	33
• Proteins: Biological significance, peptide bond, classification of proteins.	
 Nucleic acids: components of nucleic acids, sugars, purines and pyrimidines, nucleosides and nucleotides 	
• DNA: structure and properties	
 RNA: structure, types and properties 	
Genetic code and its properties	2
Total	90

CCBI 102 - Foundation in Bioinformatics

Topics	Lectures Allotted
ľ	(in hrs)
Basics in computer science	(11115)
• Definition, characteristics, limitations and concept	
Classification based on size and purpose	15
• Concept of System Software Hardware storage device, Character User Interface, Graphical User Interface, Operating System- types, multitasking	
Computer tools and internet	
Block diagram and functions of units	
Computer peripherals and memory: Input units and	
output units, their functions	
• Primary storage (RAM) and secondary storage devices (ROM Pendrive, DVD, CD)	25
• Operating systems: windows, Linux, Server	
Internet and networking: Current status, applications	
• LAN, WAN, MAN, WWW and MODEM	
Introduction to bioinformatics:	
• Definition, history and concept of bioinformatics	(
Aims and tasks of bioinformatics	6
Areas of bioinformatics	
Programming in bioinformatics	
• Computers and programs,	
Concept of programming languages	20
• Operating systems: Windows, LINUX, UNIX, MAC	
• Internet: Access, connectivity, world wide web	
Biological databases and searching	
• Types of database: Classification; Primary, secondary databases	
• Nucleic acid databases: GenBank, EMBL, DDBJ	24
Protein databases: Swiss-Prot, PDB	
Sequence retrieval system: SRS	
Total	90

Computer basics; hardware, connection cables, typing, Windows 7/8.	12
Working with MS-Office software	
Creating new documents, typing, deleting, selecting text, undo, redo,	
Formatting text – auto format, formatting, insertion of table characters,	6
Paragraphs, line spacing, margins, page setup, headers and footers, spellir	ıg
checker, auto format, auto correct, find & replace, Mail merge	
Assignments in MS-PowerPoint	
Creating slides, insertion of text, picture, table, charts etc, custom	6
Animation, slide transaction	
Assignments in MS-Excel	
Creating worksheet, Graphs, resizing graphs, formulas, if statement,	
Types of functions, frequently used mathematical and statistical	6
Functions	
Assignments in MS-Access – creating database, forms and reports	8
Creating and editing files notepad and notepad++	4
Basic commands in MS-DOS program (CUI)	4
Learning the intranet system in the laboratory and getting its Charac	
	4
Understanding the structure of Networking, LAN, WAN, MAN	6
Onderstanding the structure of Networking, LATA, WARA, MARA	
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Introduction to internet, WWW and web browsers and their Applications Internet surfing and searching information, downloading and installing	4 16
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 Introduction to internet, WWW and web browsers and their Applications Internet surfing and searching information, downloading and installing Software accessing Google scholar Searching scientific information using NCBI using ENTERZ engine 	<i>16</i> 10

8

16. Exploring nucleic acid sequence database and downloading in FASTA Format

- Dubey R.C. and Maheshwari D.K. 2004, Practical Microbiology, S.Chand and Co. Delhi.
- Aneja K.R. (1996) Experiments in Microbiology, 3rd Edition Wishwa Prakashan, New Delhi.
- Deshmukh A.M. (1997) 1st Edition, Handbook of Media, Stains and reagents in Microbiology Pama Publications.
- 4. Gaud R.S. and Gupta G.D. Practical Microbiology, Nirali Prakashan, Pune
- 5. Parija S.C., Text Book of Practical Microbiology Ahuja Publishing House, New Delhi.
- 6. Fundamentals of computers -V. Rajaraman
- 7. Computer Fundaments P.K. Sinha
- 8. Computer Fundamentals (Architecture and Organization) -B. Ram
- 9. Microsoft Office 2000 Vipra Computers
- 10. Digital Fundamentals Floyd
- 11. Digital Principles and Applications A. P. Malvino & D.P.Leach (TMH)
- 12. Modern digital Electronics (2nd Edn.) R. P. Jain
- 13. Bioinformatics Computational Molecular Biology by Zvia Agur.
- 14. Basic bioinformatics by Ignacimuthu.
- 15. An introduction to bioinformatics by Vikramsingh, Narosa Publ

Lecture attendance Certificate course in Bioinformatics 2018-19

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R. C. Patel Educational Trust's

R. C. Patel Arts, Commerce & Science College, Shirpur (Affiliated to the K.B.C. North Maharashtra University, Jalgaon)

STATEMENT OF MARKS

Certificate in Bioinformatics (CGPA Pattern)

Examination held in May 2019

Student Name : Bhoge Tejal Santosh

College Name : R. C. Patel Arts Commerce and Science College, Shirpur

Seat Number : 191105

Exam Centre : Shirpur (240051)

Paper Code	Paper Name	AM	Credits (Max.)	Marks Obtained
CCBI 101	Fundamentals of Biology	TH	6.0	92
CCBI 102	Introduction to Bioinformatics	TH	6.0	82
CCBI 103	Lab Course	PR	8.0	87

Result: Pass

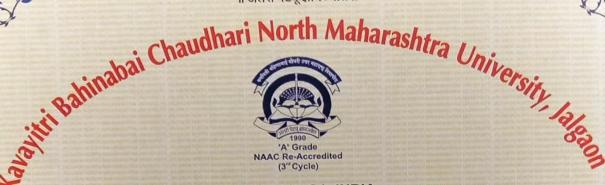
CGPA: 5.60

Grade: A

Co-ordinator

Abbreviations:

AM: Assessment Methods, P: Pass, F: Fail, AB: Absent, RR: Result Reserved, TH: Theory, PR: Practical, O: Outstanding Grade



॥ अंतरी पेटवू ज्ञानज्योत ॥

Jalgaon (M.S.), INDIA

We, the Board of Deans, Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon

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The Principal

R.C. Patel Arts, commerce and science college, shispur

do, hereby, certify that,

Mr./Ms. Patil Gayatri Nanabhau

has pursued a course of study approved by the Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon and has passed the requisite examination held in may 2018 with **B** grade and found duly qualified for the award of

Certificate in

Bioinformatics

Which is conferred on him / her on October 1st, 20**18** In testimony whereof is set the seal and signatures of authorities.



College Name	:	R.C.Patel Art	ts, Commerce & Science College, Shirpur
Title of the Course	4	Certificate C	ourse in textile Chemistry
Aims/objectives of the Course	it.	To aware the	e students about Textile chemistry, their
		applications	& career in textile industries.
Duration of Course	а	1 Year	
Fees structure		1000/	
Course structure	3	Paper-I-	Applied Chemistry for Textile Industries
		Paper-II-	Applied Chemistry of dyes & Auxiliaries
		Paper-III-	Lab Course
Eligibility for admission	:	Diploma cou	rse in Textile chemistry

Skeleton of Course

2

Sr. No.	Paper	Name of the	Theory/ Practical	Teaching Hrs	ng Max. Marks Allotted Passing						Credit	
		subject	Course		External	Internal	Total	External	Internal	Total	12.1	
1	Paper- I	Applied Chemistry for Textile Industries	Theory	90	60	40	100	24	16	40	6	
2	Paper- II	Applied Chemistry of dyes & Auxiliaries	Theory	90	60	40	100	24	16	40	6	
3	Paper- III	Lab course	Practical	120	60	40	100	24	16	40	6	

Minimum Staff : 03

1

4

Mode of examination

Internal & External (Theory & Practical)

Details of Syllabus

Enclose the syllabus copy

37

R.C.Patel Art's, Commerce & science College, Shirpur

CTC- 101- Applied Chemistry for Textile Industries

	Paper-1	THEORY	Contact Hrs- 90
1.	Elementary Chemistry:		(10 Hrs)
	Concept of atom, atomic weight, compounds & mi	e number, isotopes & isobars, mol xtures.	ecular weight & equivalent
2.	Concepts in volumetric	analysis:	(20 Hrs)
	Oxidizing & reducing a numerical, standard solution	gents, units of concentration, mol	larity, normality, formality,
3.	Acids & bases:		(20 Hrs)
	Arrhenius theory, Lewis	theory & Lowry-Bronsted theory, p	properties & uses of acids &
	bases.		
4.	Water:		(10 Hrs)
	Sources of water, impurit hardness & effects.	ies in water, hardness of water, tem	porary hardness, permanent
5.	рН & рОН;		(10 Hrs)
	Introduction, concept, def	inition, calculation of pH value of a	cid, bases. Determination of
	pH by colorimetric metho	d.	
6.	Industrial visit.		(20 Hrs)
	REFERENCE BOOKS:		

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- 1. Analytical chemistry by G. D. Chritian
- 2. Physical chemistry by Atkins.
- 3. Vogel's Textbook of Quantitative chemical analysis- Jeffry, Basset.

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R. C. Patel. A. C. S. College, Shirpur Certificate Course in Textile Chemistry 2018-2019

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R. C. Patel Educational Trust's

R. C. Patel Arts, Commerce & Science College, Shirpur [Affiliated to the K.B.C. North Maharashtra University, Jalgaon]

STATEMENT OF MARKS

Certificate course in Textile Chemistry

Examination Held in May-2019

Student Name: Girase Neha Gajendra

College Name: R.C.Patel Arts Commerce and Science College, Shirpur

Seat Number: CTC-06

Paper Code	Paper Name	AM	Credit (Max.)	Marks Obtained
CTC- 101	Applied chemistry for textile industries	TH	6	83
CTC -102	Applied chemistry of dyes and Auxiliaries	тн	6	84
CTC-103	Lab Course	PR	8	87

Result: Pass

CGPA: 5.30

Grade: A

Co-ordinator



Abbreviations:

AM: Assessment Methods, P: Pass, F: Fail, AB: Absent, RR: Result Reserved, TH: Theory, PR: Practical, O: Outstanding Grade

Maharashtra University Jalgaon Jalgaon (M.S.), INDIA

A' Grade AAC Re-Accredited (3"Cycle)

We, the Board of Deans, Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon

The Principal

R. C. Patel A.C.S. College, shirpur

do, hereby, certify that,

Mr./Ms.

Girase

til

Principal

R.C. Putul Ed

Principal

Loothin Bahimabai Ch.

Neha Gajendrasing

has pursued a course of study approved by the Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon and has passed the requisite examination held in May 2019 with 'A' grade and found duly qualified for the award of

Certificate in

Textile chemistry

Which is conferred on him / her on October 1", 2019 In testimony whereof is set the seal and signatures of authorities.

College Name	E .	R.C.Patel Art	ts, Commerce & Science College, Shirpur
Title of the Course	8	Diploma Cou	urse in textile Chemistry
Aims/objectives of the Course	\$	To aware the	e students about Textile chemistry, their
		applications	& career in textile industries.
Duration of Course	30	1 Year	
Fees structure	ċ.	1000/	
Course structure	÷	Paper-I-	Chemistry of Polymers in Textile Industries
		Paper-II-	Chemistry of Fibres in Textile Industries
		Paper-III-	Lab Course
Eligibility for admission	ş.	Certificate co	ourse in Textile chemistry

Skeleton of Course

Sr. No.	Paper	Name of the	Theory/ Practical Course	Teaching Hrs	Max. Ma	Max. Marks Allotted Passing					
		subject		10.5	External	Internal	Total	External	Internal	Total	24
1	Paper- I	Chemistry of Polymers in Textile Industries	Theory	90	60	40	100	24	16	40	6
2	Paper- II	Chemistry of Fibres in Textile Industries	Theory	90	60	40	100	24	16	40	6
3	Paper- III	Lab course	Practical	120	60	40	100	24	16	40	6

Minimum Staff

: 03

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Mode of examination

Internal & External (Theory & Practical)

Details of Syllabus

Enclose the syllabus copy

R.C.Patel Art's, Commerce & science College, Shirpur

DTC- 101- Chemistry of Polymers in Textile Industries

	Paper-I TF	IEORY	c	ontact Hrs- 90
1.	Basic Determinants of Fibre Forming F			(20 Hrs)
	Importance of polymer science. Various	applications of po	olymers. Classificatio	n of polymers.
	Definition of monomer, oligomer, hig			
	solubility parameter, glass transition temp			
2.	Condensation Polymerization:		,	(15 Hrs)
	Mechanism, types, featness, essential polymerization.	requirements	and importance of	condensation
3.	Mechanism of Polymers:			(20 Hrs)
	Nomenclature, Dyestuff chemistry, Typ	es of dyes & pig	gments, Manufacturi	ng of dyes.
1.				(20 Hrs)
	Characterization of polymers by different	ent physical tech	nniques such as DTA	, DSC, TGA,
	IR, X-Ray diffraction			
2.	Developments in polymers for textiles	s:		(15 Hrs)
	Synthetic polymers, Polymer waste and	l techniques of u	tilisation.	
	REFERENCE BOOKS:			
1.	Polymer science- V. R. Gowarikar			
2.	Natural Polymer man-made Fibres, Car	rol and Porczyn	ski C.Z., National Tr	ade Press
	Ltd., London, 1965.			
3.	Visco-Elastic Properties of Polymers, F	erry, J.D., John	Wiley and Sons, New	v York, 3rd
	edition, 1980.			
4.	Textbook of Polymer Science, Bill Mey	yer F.W., John V	Wiley and Sons, New	York, 3rd
	Edition, 1984.			

5. Vogel's Textbook of Quantitative chemical analysis- Jeffry, Basset.

R. C. Patel Art's, Commerce & science College, Shirpur

DTC- 102- Chemistry of Fibres in Textile Industries

	Paper- II	THEORY	Contact Hrs- 90
1	. Fibres:		(15 Hrs)
	Introduction, Classifica	ation, Characteristics of Fibres	
2	. Fundamentals of Fibre	Spinning-	(20 Hrs)
		he spinning process, Theory of solidifi	ication of polymer in various
		encept of melt spinning, general features	
	melt spinning.		
3	. Polyester fibres:		(20 Hrs)
	Raw materials, manufa polyester.	acturing process, physical and chemica	al properties and end uses of
4	. Ployamide fibre:		(20 Hrs)
	Raw materials, manufa Nylon-6 and Nylon-66.	acturing process, physical and chemica	al properties and end uses of
5		al importance of Natural fibres:	(15 Hrs)
		nie, jute, linen, pineapple, Natural Ban	nboo fibers, their occurrence,
TEX	T/REFERENCE BOOH	(S:	
I. T	extile Fibres, Shenai V.A	., Vol-1, Sevak Publications, Bombay	, 3rd edition, 1991.
	extbook of chemistry for		
		logy of Textile fibres- E. R. Trotman	

- 4. Microscopy of Textile Fibres, Greaves, P.H., Saville B.P.Oxford: BIOS Scientific Publishers Ltd., 1995,
- 5. Handbook of Fibre Chemistry, Lewin Menachem, Eli M. Pearce, Marcel Dekker Inc., New York, 2nd edition, 1998.
- 6. Analysis of Chemicals- N. F. Desai.

R.C.Patel Art's, Commerce & science College, Shirpur

DTC- 103- Practical Course

Paper-III

LAB COURSE

- Determination of Total hardness of given water sample by EDTA solution method.
- 2. To find alkalinity of water by indicator method.
- 3. To determine the saponification value of given coconut oil sample.
- 4. Preparation of color dyes.
- 5. Measurement of absorbance of color dyes by colorimeter.
- 6. To determine suspended solids of given water sample.
- 7. To determine the purity percentage of NaCl.
- 8. To determine the purity percentage of Na₂SO₄.
- 9. To determine the purity percentage of Na₂S₂O₄.
- 10. Detection of type & functional group.
- 11. Detection of type & functional group.
- 12. Detection of type & functional group.
- 13. Detection of type & functional group.
- 14. Microsoft excel operating skills.
- 15. Microsoft Power point operating skills.
- 16. Determination of P¹¹ of water.
- 17. Purification of impure water by treatment.
- 18. Determination of TDS of water.

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	Sir						pirelom	a cour	se in	Texti	le chem.	
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		10						(N	fate	gnature of	Candidate)	
	(Name and Signature of Candidate) PARTICULARS OF CANDIDATE											
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List of Admitted Students for "Diploma Course in Textile Chemistry"

For the Academic Year 2018 -19

Name of College:	
Name of Career Oriented Cours	e:
Academic Year:	

R. C. P. A.C. S. College, Shirpur Diploma Course in Textile Chemistry 2018-19

60

Intake Capacity:

Sr. No.	Name of Student	Gender	Category	Education Qualification	Year of passing	Presently admitted	Remark (if any)
1.	BHAMARE NILESH PRAKASH	Male	OBC	СТС	2018	S. Y. B. Sc.	-
2.	CHAUDHARI KRISHNA PRAVIN	Male	OBC	стс	2018	S. Y. B. Sc.	
3.	CHAUDHARI PARESH SHARAD	Male	OBC	стс	2018	S. Y. B. Sc.	
4.	DESALE VISHAL KANHYALAL	Male	OBC	стс	2018	S. Y. B. Sc.	
5.	GUJAR SAURABH JAGDISH	Male	OBC	CTC	2018	S. Y. B. Sc.	
6.	MAHAJAN PREM SUNIL	Male	OBC	CTC	2018	S. Y. B. Sc.	
7.	MALI KAILAS BABAN	Male	OBC	СТС	2018	S. Y. B. Sc.	
8.	PATEL RIYAJ FARUK	Male	OPEN	СТС	2018	S. Y. B. Sc.	
9.	PATEL VASUDEO BHARAT	Male	OBC	СТС	2018	S. Y. B. Sc.	
10.	PATIL AMOL ASHOK	Male	OBC	СТС	2018	S. Y. B. Sc.	

11.	PATIL DIVYA SANJAY	Female	OBC	CTC	2018	S. Y. B. Sc.
12.	PATIL RAVINDRA ASHOK	Male	OBC	CTC	2018	S. Y. B. Sc.
13.	PATIL SAGAR PRABHAKAR	Male	OBC	CTC	2018	S. Y. B. Sc.
14.	PATIL SANDIP VINOD	Male	OBC	CTC	2018	S. Y. B. Sc.
15.	PATIL SAURABH RAVINDRA	Male	OBC	СТС	2018	S. Y. B. Sc.
16.	PATIL YOGITA RAJENDRA	Female	OBC	СТС	2018	S. Y. B. Sc.
17,	PAWAR YOGITA DEVIDAS	Female	OBC	СТС	2018	S. Y. B. Sc.
18.	SONAWANE NISHA DHANRAJ	Female	OBC	СТС	2018	S. Y. B. Sc.

Certificate

This is to certify that the document regarding educational qualifications of the above students have been verified and found correct. The students mentioned in the list are eligible for the admission to the above mentioned course as per University Ordinance-181.

Tesanawa Co-ordinator Mr. Jayvant P. Sonawane

Delat.e Principal . Dr. D. R. Patil

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R. C. Patel Educational Trust's

R. C. Patel Arts, Commerce & Science College, Shirpur (Affiliated to the K.B.C. North Maharashtra University, Jalgaon)

STATEMENT OF MARKS

Diploma in Textile Chemistry

Examination Held in May -2019

Student Name: Patel Riyaj Faruk

College Name: R.C.Patel Arts Commerce and Science College, Shirpur

Seat Number: DTC -08

Paper Code	Paper Name	AM	Credit (Max.)	Marks Obtained
DTC-101	Chemistry of Polymer in Textile Industries	TH	6	94
DTC-102	Chemistry of Fibres in Textile Industries	ТН	6	91
DTC-103	Lab Course	PR	8	95

Result: Pass

CGPA: 6.30

Grade: O

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Co-ordinator

Abbreviations:

AM: Assessment Methods, P: Pass, F: Fail, AB: Absent, RR: Result Reserved, TH: Theory, PR: Practical, O: Outstanding Grade

K.B.C. North Maharashtra University, Jalgaon , Ordinance 181

R. C. Patel Arts, Commerce & Science College,Shirpur Dist- Dhule

Name of Career Oriented Course

Advance Diploma Course in Textile Chemistry

Faculty

Science

Academic Year

2018-19

College Name: R.C.Patel Arts, Commerce & Science College, Shirpur

Title of the Course: Advanced Diploma Course in textile Chemistry

Aims/objectives of the Course: To aware the students about Textile chemistry, their Applications & career in textile industries

Duration of Course	:	1 Year	
Fees structure	:	1000/	
Course structure	:	Paper-I-	Polymers in Textile Industries
		Paper-II-	Chemistry in Textile
		IndustriesP	aper-III- Lab Course
Eligibility for admissio	n:	Diploma co	ourse in Textile chemistry

Skeleton of Course

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Sr. No.	Paper	Nam e of	Theor y/	Teachi ng	Max. N Allotte			Passing	Credit		
		the subje ct	Practi cal Cours e	Hrs.	Exter nal	Inter nal	Tot al	Exter nal	Inter nal	Tot al	
1	Paper -I	Poly mers in Textil e Indus tries	Theor y	90	60	40	100	24	16	40	6
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Minimum Staff : 03

Mode of examination : Internal & External (Theory & Practical)

Details of Syllabus : **Enclose the syllabus copy**

R.C.Patel Art's, Commerce & Science College, Shirpur

ADC- 101- Polymers in Textile Industries

	Paper- I	THEORY	Contact Hrs 90
1.	Dyeing:		(15 Hrs)
	Physical Chemistry of	dyeing, Dye stuff manufacturing	g
2.	Polymerization:		(20 Hrs)
	Emulsion, dispersion, s	solution, synthetic production of	f Nylon, Polyester
3.	Acids & bases:		(20 Hrs)
	Arrhenius theory, Lew	is theory & Lowry-Bronsted the	eory, properties & uses
	of acids & bases		
4.	Non-fibrous polymer:		(15 Hrs)
	Introduction, chemistry	y of gum, starches, proteins, enz	ymes
5.	Green Chemistry:		(10 Hrs)
	Introduction, importan	ce & need, green approaches in	chemistry
6.	Industrial visit		(10 Hrs)
R	EFERENCE BOOKS:		

- 1. Analytical chemistry by G. D. Chritian
- 2. Physical chemistry by Atkins.
- 3. Vogel's Textbook of Quantitative chemical analysis- Jeffry, Basset.

R. C. Patel Art's, Commerce & science College, Shirpur

ADC- 102- Chemistry in Textile Industries

Paper- II

THEORY

Contact Hrs-90

(15 Hrs)

- 1. Surface active agents (20 Hrs)

 Definition, surface activity, wetting, leveling and dispersing, types,

 characteristics &textile applications
- Brief study of chemicals useful in textile industries: (20 Hrs.) Acetic acid, aluminum acetate, calcium carbonate, copper sulphate, lead acetate,potassium chromate, sodium sulphate, sodium nitrate, sodium silicate, ZnO, ZnCl, NaCl& other related chemicals.
- 3. Electrochemistry: (20 Hrs) Cathodic & anodic protection, alloy such as brass, bronze & their properties, inhibitors.
- 4. Colour chemistry: (15 Hrs)

Introduction, knowledge of dyeing machines, bathochromic shift

Auxochromic shift, chromophore, auxochromes.

5. Textile Industrial visit report:

TEXT/REFERENCE BOOKS:

- 1. Textile Fibres, Shenai V.A., Vol-1, Sevak Publications, Bombay, 3rd edition, 1991.
- 2. Textbook of chemistry for PUC (Vol- I & II)
- 3. Dyeing & chemical technology of Textile fibres- E. R. Trotman
- 4. Physical chemistry by Atkins.
- 5. Analysis of Chemicals- N. F. Desai.

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R.C.Patel Art's, Commerce & Science College, Shirpur

ADC-103-Practical Course

Paper- III

LAB COURSE

- 1. Binary organic mixture.
- 2. Binary organic mixture.
- 3. Binary organic mixture.
- 4. Binary organic mixture.
- 5. Organic qualitative analysis.
- 6. Organic qualitative analysis.
- 7. Organic qualitative analysis
- 8. Dyeing of cotton hank with hot brand reactive dye.
- 9. Dyeing of cotton hank with vinyl sulphone

reactive dye.

- 10. Dyeing of cotton hank with hot vat colors.
- 11. Dyeing of cotton hank with hot Sulphur black.
- 12. Dyeing of cotton hank with Naphthol colour.
- 13. Determination of strength of formaldehyde solution.
- 14. Introduction of Internet
- 15. Introduction to MS-WORD
- 16. Working on Microsoft Word.
- 17. Working on Microsoft Excel.
- 18. Working on Microsoft PowerPoint.

R.C. Pa Shirpur, Dis	el Educational Trust tel Arts, Comn t – Dhule, M.S. 425 405 edited Institute)		cience College
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R. C. Patel. A. C. S. College, Shirpur Advanced Diploma Course in Textile Chemistry 2018-2019

R. C. Patel. A. C. S. College, Shirpur Advanced Diploma Course in Textile Chemistry 2019-2020

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R. C. Patel Educational Trust's

R. C. Patel Arts, Commerce & Science College, Shirpur (Affiliated to the K.B.C. North Maharashtra University, Jalgaon)

STATEMENT OF MARKS

Advance Diploma in Textile Chemistry

Examination Held in May-2019

Student Name: Patel Rinkal Sanjay

College Name: R.C.Patel Arts Commerce and Science College, Shirpur

Seat Number: ADC -09

Paper Code	Paper Name	AM	Credit (Max.)	Marks Obtained	
ADC-101	Polymers in Textile industries	тн	6	85	
ADC-102	Chemistry in Textile industries	ТН	6	82	
ADC-103	Lab Course	PR	8	92	

Result: Pass

CGPA: 5.65

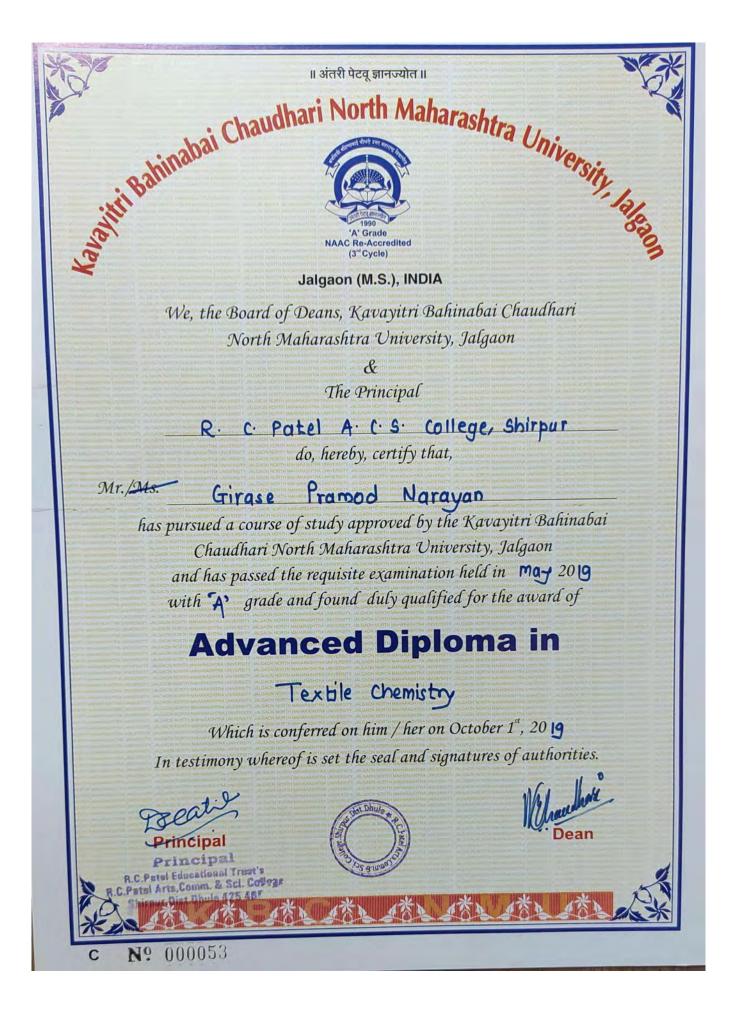
Grade: A



Co-ordinator

Abbreviations:

AM: Assessment Methods, P: Pass, F: Fail, AB: Absent, RR: Result Reserved, TH: Theory, PR: Practical, O: Outstanding Grade



Kaviyatri Bahinabai Chaudhari North Maharashtra University, Jalgaon Ordinance 181

College R. C. Patel Arts, Commerce and Science College, Shirpur

Name of career oriented course Certificate Course in Women Studies

Faculty Arts, Commerce and Science

Academic year (2019-20)

K.B.C. North Maharashtra University, Jalgaon Ordinance 181

College name	:	R. C. Patel Arts, Science and Commerce College, Shirpur
Title of the course	:	Certificate Course in Women Studies
Aims/Objective of the course	:	To empower women in field of education, health, women laws, gender sensitization
Duration of the course	:	1 Year
Fees structure	:	Rs. 500/-
Course structure	:	Paper I: Gender and Education Paper II: Women Work and Employment Paper III: Field Work
Eligibility for admission	:	XII th

Skeleton of course:

Sr	Donon	Name of subject	Theory /	\tilde{c} $n\sigma$					Credit		
No	Paper	Name of subject	Practical	ng	Extern	Inter	Total	Exter	Inte	Total	Crean
				hours	al	nal		nal	rnal		
1.	Paper I	Gender and Education	Theory	90	60	40	100	24	16	40	6
2.	Paper II	Women Work and	Theory	90	60	40	100	24	16	40	6
		Employment						24	10	40	6
3.	Paper III	Field Work	Practical	120	60	40	100	24	16	40	8

CCWS 101: Gender and Education

Topics	Lectures allotted (in hrs)
Unit – I Introduction to Gender Sensitization	
• Key concepts in Gender studies.	
• Need, Scope and challenges of Women's Studies – Women's Studies as an academic discipline. Women's Studies to Gender Studies, Need for Gender Sensitization.	22
National Committees and Commissions for Women.	
Unit – II Gender and Education	
 Women's Education – Gender diversities and disparities in enrolment, Curriculum content, Dropouts, profession and Gender. Gendered Education- Family, Culture, Gender roles, Gender Identities. 	
• Education for the Marginalized Women.	22
• Recent Trends in Women's Education – Committees and Commissions on Education.	
• Vocational education and skill Development for women.	
Unit – III Gender and Media	
• Discourse on Women and Media Studies- Mainstream Media, Feminist Media.	
• Coverage of Women's issues and issues of women in Mass Media and Media Organizations (Audio-Visual and Print media).	
• Digital Media and legal protection.	24
• Alternative Media – Folk Art, Street Play and Theatre.	
• Indecent Representation of Women (Prohibition) Act, 1986, Impact of media on women.	
Unit – IV Gender and Entrepreneurship	
• Concept and meaning, Importance of Entrepreneurship, Entrepreneurial traits, Factors contributing to Entrepreneurship, enabling environment, small Enterprises, women in agri-business.	22
Gender and emerging Technology – Impact.	
Self-help Groups and Micro Credit.	
• Gender mainstreaming, Gender budgeting, planning and Analysis.	

COWS 102. Women Werds and Frombann		otal	90
CCWS 102: Women Work and Employm Topics	ent		es allotteo hrs)
Unit – I Introduction to Women's Education			
 Women's Education – Gender bias in enrolment – Curriculum cor – Dropouts. Negative capability in Education – Values in Education – Vocati Education. Recent Trends in Women's Education – Committees Commissions on Education. Adult Literacy and Non – formal education for women's development 	onal and	2	20
Unit – II Concept of Work			
 Concept of Work – Productive and non – productive work – Use value and market value. Gender Division of Labor – Mode of Production – Women organized and unorganized sector. Training, skills and income generation. New Economic Policy and its impact on Women's Employme Globalization – Structural Adjustment Programs 			22
Unit – III Women and Health			
 Gender in Health – Health status of women in India – Mortality Morbidity factors influencing health – Nutrition and health – HIV AIDS control programme. National Health and Population Policies and Programmes – Mate and Child Health (MCH) to Reproductive and Child he approaches, Issues of old age. Women and Environment – Nature as feminine principle – B needs in Rural and Urban Environments – Care and managemen natural resources – Depletion of natural resources – Sustain environment and impact on women. 	and ernal ealth Basic nt of		24
Unit – IV Women and Media			

media on women.

- Indian Constitution and provisions relating to women.
- Personal laws Labour Laws Violence against, women Legal protection – Family Courts – Enforcement machinery – Police and Judiciary.
- Human Rights as Women's Rights

Total 90

CCWS 103: Field Work

Field work specially related to women's problem, report submission and oral presentation

References:

- Domestic Women Workers in India, Seepana Prakasham, Shipra Publication, 2012,202P
- Women's Studies in India by Maithreyi Krishna Raj
- Indian Women in History and Culture, Prof. Geraldine Forbes
- Women's Work in Globalizing India, Never Done and Poorly Paid Ghosh J.,New Delhi, Women Unlimited, 2009
- Journal of Gender Social Policy and Law
- Susan S. Wadly, "Women and the Hindu Tradition", Signs, 3:1 (August 1977)
- Butalia, U. and T Sarkar, (eds.), Women and the Hindu Right, New Delhi, Kali for women, 1996
- Sunder Rajan, R., The Scandal of the State: Women, Law and Citizenship in Postcolonial India, New Delhi, Permanent Black, 2004.
- Domestic Violence Against Women: Legal Protection Legislative and Judicial Aspects, Nitu Nawal and R.K.Sharma, Regal Publications, 2013 XVI, 462P

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List of Admitted Students for "Certificate Course in Women Studies"

For the Academic Year 2018 -19

Name of College:	R. C. P. A.C. S. College, Shirpur
Name of Career Oriented Course:	Certificate Course in Women Studies
Academic Year:	2018-2019
Intake Capacity:	60

Sr. No.	Name of Student	Gender	Category	Education Qualification	Year of passing	Presently admitted	Remark (if any)
1.	Patil Priyanka Santosh	Female	OBC	XII Science	2018	F. Y. B. Sc.	
2.	Girase Neha Gajendra	Female	Open	XII Science	2018	F. Y. B. Sc.	
3.	Jadhav Bhagyashri Meherban	Female	OBC	XII Science	2018	F. Y. B. Sc.	
4.	Pawar Dhanashri Sharad	Female	OBC	XII Science	2018	F. Y. B. Sc.	
5.	Shivde Rajani Rajendra	Female	NT B	XII Science	2018	F. Y. B. Sc.	
6.	Rajput Divya Rajendra	Female	Open	XII Science	2018	F. Y. B. Sc.	
7.	Patil Namrata Kishor	Female	OBC	XII Science	2018	F. Y. B. Sc.	
8.	Jamadar Divya Nitin	Female	Open	XII Science	2018	F. Y. B. Sc.	
9.	Sanke Shital Bansilal	Female	OBC	XII Science	2018	F. Y. B. Sc.	
10.	Mahajan Tejaswini Mahendra	Female	OBC	XII Science	2018	F. Y. B. Sc.	
11.	Mahajan Minakshi Gulab	Female	OBC	XII Science	2018	F. Y. B. Sc.	
12.	Patil Shradhha Jagdish	Female	OBC	XII Science	2018	F. Y. B. Sc.	-

R.C.Patel Art's Commerce and Science College Shirpur

Year: 2018-19

Certificate Course in Women Studies

Students Attendance

Sr.	Students Name	Students Signature											
No.		27/8/18	2818118	2978/18	24/9/18	2519/18	2619118	8/10/18	9/10/18	101018	3/10/12	4/12/18	5112/18
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Dr. Vandana Patil

Co-ordinator



R. C. Patel Educational Trust's

R. C. Patel Arts, Commerce & Science College, Shirpur (Affiliated to the K.B.C. North Maharashtra University, Jalgaon)

STATEMENT OF MARKS

Certificate in Women Studies (CGPA Pattern)

Examination held in May 2019

Student Name : Badgujar Komal Bhatu

College Name : R. C. Patel Arts Commerce and Science College, Shirpur

Seat Number : 199101

Exam Centre : Shirpur (240051)

Paper Code	Paper Name	AM	Credits (Max.)	Marks Obtained
CCWS 101	Gender and Education	ТН	6.0	74
CCWS 102	Women Work and Employment	TH	6.0	79
CCWS103	Field Work	FW	8.0	82

 Result: Pass
 CGPA: 4.65
 Grade: A

 Grade: A
 Grade: A
 Grade: A

 Abbreviations:
 Co-ordinator

 AM: Assessment Methods, P: Pass, F: Fail, AB: Absent, RR: Result Reserved, TH: Theory, PR: Practical, O: Outstanding Grade



K.B.C. North Maharashtra University, Jalgaon Ordinance 181

R. C. Patel Arts, Commerce and Science College, Shirpur

Name of career oriented course Certificate Course in Plant Tissue Culture

Faculty SCIENCE

Academic year (2018-19)

College name	:	R. C. Patel Arts, Science and Commerce College, Shirpur
Title of the course	:	Certificate Course in plant tissue culture
Aims/Objective of the course	:	To make students acquaint about methods in plant tissue
		culture and their applications.
Duration of the course	:	1 Year
Fees structure	:	Rs. 1000/-
Course structure	:	Paper I: Fundamentals in Plant Physiology
		Paper II: Basics in Plant Tissue Culture
		Paper III: Lab Course
Eligibility for admission	:	12 th Science

Skeleton of course:

Sr	Domon	Norme of subject	Theory /	Teachi		mum n allotted		Р	assing		Credit
No	Paper	Name of subject	Practic	ng hours	Extern	Inter	Total	Exter	Inte	Total	Crean
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1.	Paper I	Fundamentals in Plant Physiology	Theory	90	60	40	100	24	16	40	6
2.	Paper II	Basics in Plant Tissue Culture	Theory	90	60	40	100	24	16	40	6
3.	Paper III	Lab course	Practical	120	60	40	100	24	16	40	8

Minimum staff	:	03
Mode of examination	:	Internal and external
		(Theory and Practical)
Detail syllabus	:	Syllabus copy attached

CCPTC 101: Fundamentals in Plant Physiology

1. Plant Cell: Topics	Lectures Allotted
1.1 Plant cell organelles: structure and function	
	eticulum,
Vacuole, Golgi apparatus, Plastid & Nucleus	
1.2 Storage granules	12
1.3 Osmosis: Role in turgidity	
1.4 Homeostasis: concept and significance	
2. Plant water relation and transport:	
2.1 Absorption and movement of water: Theories of water	
translocation, Transpiration, Stomatal physiology.	
2.2 Nutrient Transport: Passive transport, Active transport,	10
Permeability.	
2.3 Conservation of water	
3. Photosynthesis:	
3.1 Photosynthesis: Concept, History,	
3.2 Photosynthetic apparatus: Chloroplast, Pigments	
3.3 Photosystem-I and Photosystem-II	
3.4 Light reaction: Photophosphorylation (cyclic and non-cyc	
3.5 Dark reaction; C3 pathway or Blackmanns reaction or Cal	vin
cycle	
3.6 Significance of photosynthesis	
• Growth and development in Plants:	
4.1 Plant growth: Cell cycle: Mitosis	
4.2 Growth kinetics: Whole organs (S-shaped growth curve)	
4.3 Growth of plant organs: roots, stems, leaves, flowers, see	ds
and fruits	12
4.4 Morphogenesis, Juvenility, Totipotency	
4.5 Media nutrients and requirements of growth	
5. Plant Hormones:	
Concept of hormones and their role in Plant tissue culture	
5.1 Auxins: introduction, Mechanism of action, use as herbici-	des
5.2 Cytokines: Introduction, Mechanism of Action,	
5.3 Gibberellins: Introduction, Mechanism of action, commer uses of Gibberellins	rcial 10
5.4 Ethylene: Introduction, Action, Role in flowering.	
5.5 Abscisic acid (ABA): Introduction, Action, Role.	
6. Plant diseases	
6.1 Citrus Canker Powdery mildew in apple	
6.2 Whip Smuts of Sugarcane	12
6.3 Leaf spots in Tikka disease of groundnut	
73	

CCPTC 102: Basics in Plant Tissue Culture

Topics	Lectures allotte
1. Introduction to PTC Laboratory:	
1.1 Introduction & Organization of PTC lab:	
1.2 Development of Tissue culture media	
1.3 Media constituents: Inorganic and organic nutrients, growth	14
Hormones, gelling agents	
1.4 Media preparation and methods of sterilization	
2. Totipotency and Cytodifferentiation:	
2.1 Totipotency: Introduction, Expression, significance	12
2.2 Cytodiffertiation: Introduction, Process, Factors affecting	
cytodifferentiation	
3. Organ culture:	
Different types of organ culture (principle, protocol, and	14
Importance)	
3.1 Root culture	
3.2 Leaf culture	
3.3 Meristem; shoot tip culture, flower culture	
3.4 Ovary culture3.5 Anther and pollen culture	
4. Callus culture:	
4.1 Callus culture: Introduction and principle	12
4.2 Characteristics of callus	14
4.3 Process of callus formation	
4.4 Methods and significance of callus	
5. Somatic embryogenesis:	
5.1 Somatic embryogenesis: Introduction and principle and	14
Significance	
5.2 Methods in somatic embryogenesis	
5.3 Factors affecting on somatic embryogenesis	
5.4 Artificial seeds: development and uses	
6. Application of plant tissue culture:	
6.1 Micro propagation	12
6.2 Clonal propagation	
6.3 Production of genetically variable plants	
6.4 Plant pathology and plant tissue culture	
6.5 Plant breeding	
6.6 Production of useful biochemical	

CCPTC 103: Lab Course

Sr. No.	Lab course	Lectures allotted
1.	Overview to plant tissue culture laboratory.	08
2.	Preparation of stock solutions	08
3.	Preparation of growth media.	10
4.	Preparation and sterilization of explants	08
5.	Production of callus by using carrot/Clitoria ternetia/ Hibiscus rosa sinensis.	10
6.	shoot tip culture	08
7.	Study of somatic embryogenesis by using groundnut/ Wheat	08
8.	Initiation of cell suspension culture	12
9.	Study of micro propagation	08
10.	Study of transpiration	08
11.	Study of embryo culture	10
12.	Estimation of chlorophyll content from different plant leafs.	06
13.	Study of stomatal physiology.	08
14.	Study of cell cycle: various mitotic stages	08

References:

- 1. Kalyan Kumar De, Plant tissue culture.
- 2. Plant tissue culture, S. S. Bhojwani and M.K. Rajdhan.
- 3. Plant biotechnology and its application in tissue culture; Ashwini Kumar, Shikha Roy, IK International publication.
- 4. Plant physiology ; Fourth edition, Salisburry Ross, Thomson, Wadsworth publication
- 5. Plant physiology; C. P. Malik, Kalyani publication ,New Delhi Ludhiana
- 6. Plant physiology; Second edition, G. Ray Noggle, George J. Fritz, Prentice Hall of India private limited.
- 7. Plant physiology; R.S.Mehrotra, Ashok aggrawal, Tata McGraw Hill.
- 8. Kalyan Kumar De, Plant tissue culture.
- 9. Plant tissue culture, S.S.Bhojwani and M.K. Rajdhan.
- 10. Plant biotechnology and its application in tissue culture; Ashwini Kumar, Shikha Roy, IK International publication.
- 11. Plant tissue culture, S.S. Purohit.

		Lecture attendance Certificate course in Plant tissue Culture 2018-19
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R. C. Patel Arts, Commerce & Science College, Shirpur (Affiliated to the K.B.C. North Maharashtra University, Jalgaon)

STATEMENT OF MARKS

Certificate in Plant Tissue Culture (CGPA Pattern)

Examination held in May 2019

Student Name : Dore Dipak Ishwar

College Name : R. C. Patel Arts Commerce and Science College, Shirpur

Seat Number : 192102

Exam Centre : Shirpur (240051)

Paper Code	Paper Name	АМ	Credits (Max.)	Marks Obtained
ССРТС 101	Plant Physiology	TH	6.0	85
CCPTC 102	Plant tissue culture	TH	6.0	81
CCPTC 103	Lab Course	PR	8.0	85

Result: Pass

CGPA: 5.45

Grade: A

Co-ordinator

Abbreviations:

AM: Assessment Methods, P: Pass, F: Fail, AB: Absent, RR: Result Reserved, TH: Theory, PR: Practical, O: Outstanding Grade



K.B.C. North Maharashtra University, Jalgaon Ordinance 181

College R. C. Patel Arts, Commerce and Science College, Shirpur

Name of career oriented course Diploma in Bioinformatics

Faculty SCIENCE

Academic year (2018-19)

K.B.C. North Maharashtra University, Jalgaon Ordinance 181

College name	:	R. C. Patel Arts, Science and Commerce College, Shirpur
Title of the course	:	Diploma In Bioinformatics
Aims/Objective of the course	:	To make students acquaint about methods in bioinformatics and their applications in life sciences
Duration of the course	:	1 Year
Fees structure	:	Rs. 1000/-
Course structure	:	Paper I: Basics in cell Sciences Paper II: Fundamentals of Bioinformatics Paper III: Lab Course
Eligibility for admission	:	Certificate Course in Bioinformatics

Skeleton of course:

Sr	Donon	Nome of autient	Theory /	Teachi		mum n allotted		P	assing		Credit
No	Paper	Name of subject	Practic	ng hours	Extern	Inter	Total	Exter	Inte	Total	Crean
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4.	Paper I	Basics in Cell Science	Theory	90	60	40	100	24	16	40	6
5.	Paper II	Fundamentals of Bioinformatics	Theory	90	60	40	100	24	16	40	6
6.	Paper III	Lab course	Practical	120	60	40	100	24	16	40	8

DBI 101: Basics in Cell sciences

Topics	Lectures allottee (in hrs)
Cell Organization:	
Prokaryotic cell: Structure & Organelles	
Plant cell: Structure & Organelles	
Animal cell: Structure & Organelles	
Golgi apparatus	15
RER and SER	15
Mitochondria	
Plastids, vacuole	
Nucleus	
Endoplasmic reticulum	
Basics in Genetics:	
Concept of genes and genome	
Chromosome: Structure and composition (Histones & Nucleosome)	15
Mutation: Concept and types (Point, nonsense, frameshift,	
transitions, transversions)	
Cell Cycle:	
Mitosis: Introduction, Steps, significance	15
Meiosis: Introduction, Steps, significance	15
Differences Mitosis & Meosis	
Central Dogma of Molecular Biology :	
DNA replication : Details of replication : Initiation, Elongation,	
Termination	
Transcription : Details of transcription : Initiation, Elongation, Termination	15
Translation: Details of translation: Initiation, Elongation,	
Termination	
Basics in Immunology:	
Background of Immune system, Concept of immunity	
Cells and organs of immune system	
Concept of antigen: Types of antigen, antigenic determinants	
Concept of Hapten; antigen and Immunogen	30
Concept of Antibody: Structure, types and functions (IgA, IgG,	
IgM. IgD and IgE)	
Overview of immune responses: CMI and humoral immune	
response	
Total	90

Topics	Lectures allotted (in hrs)
Alignment and Comparisons of Sequence	
Study of single sequence	
Outline of Single sequence alignments:	
Pair wise alignments, Scoring matrix, PAM, BLOSUM, Gap	
penalty;	
Alignment types: Global and local alignment	30
Alignment algorithms:	
Dynamic methods: Needleman-Wunsch algorithm, Smith-	
Waterman algorithm;	
Heuristic methods: FASTA, BLAST;	
Multiple sequence alignments:	
ClustalW, ClustalX; PSI-BLAST: BLAST searches	
Gene studies	
Introduction to Gene prediction strategies	
Basics in Exon prediction	15
Background in Protein prediction strategies	
Basics in Coding sequence prediction	
Tools available for prediction of gene	
Proteins alignments	
Background of Protein structure alignments	
Secondary structure prediction strategies	20
Three-dimensional structure determination	20
Comparison of protein structures	
Different structure alignment algorithms	
Data mining	
NCBI resources	
SRS	
OMIM tool	10
ENTREZ search engine	
Advanced search	
UniProt	
Outline to tools	
ClustalOmega	
ClustalW	
MEGA5 Phylip package	15
JMol	
SPDBV	
Mol-Mol	
Total	90

DBI 103: Lab Course

Lab work	Periods allotted (in hrs)
Study of Sequence alignment using ClustalOmega	6
Study of Retrieving DNA/RNA sequence in FASTA file format from NCBI.	4
Searching and downloading pdb files from protein data bank.	4
Protein structure visualization using SPDBV	6
Search and retrieve protein data from UniProtKB/Swiss-Prot and UniProtKB/TrEMBL	4
Similarity searching using BLAST for DNA / protein sequence.	4
Sequence alignment using Needle / Water program	6
Exploring database at NCBI and querying the PUBMED database using the ENTREZ search engine	8
Sequence alignment using Needleman-Wunsch algorithm	6
Sequence alignment using Smith-Waterman algorithm	8
Multiple sequence alignment using BLAST	7
Searching for protein sequence alignments using pBLAST	5
Designing primers for given DNA sequence using online tools	8
Predicting protein properties from ExPASy server using 'ProtParam'	8
Protein sequence similarity search using FASTA at EBI	8
ractical based on DAMBE software	
Alignment of nucleic acid sequence to aligned amino acid sequence	4
Calculating amino acid frequency from given sequence	4
Determination of tRNA loop of given sequence	4
Extract secondary structure from a pdb file	4
Secondary structure prediction using CFSSP	4
Study of ProtParam	8
Total	120

References:

- 1. Singh Bharat, "Immunology", Pointer Pub, Jaipur.
- 2. Yadav .P.R,"Immunology", Dicovery Pub House, New Delhi.
- 3. Coleman.R.M, Lombard.M.F, Sicard.R.E, Rencocca.N.J, "Fundamentals of
- 4. Immunology" by W.C.Brown Pub,1989
- 5. S.C. Rastogi, Namita Mendirata, Parag Rastogi Bioinformatics concepts Skills and application, CBS publisher
- 6. D. Baxevanis and F. Oulette, (2002), "Bioinformatics: A practical guide to the analysis of genes and proteins", Wiley
- 7. Arthur M. Lesk, (2002), "Introduction to Bioinformatics" Oxford University
- 8. Alexis Leon and Mathews Leon Introduction to computers with MS -Office 2000 Tata Mcgrow Hill.
- 9. Bioinformatics Computational Molecular Biology by Zvia Agur.
- 10. "Basic Bioinformatics" by Ignacimuthu.
- 11. An introduction to bioinformatics by vikramsingh, Narosa Publications.



R. C. Patel Educational Trust's

R. C. Patel Arts, Commerce & Science College, Shirpur [Affiliated to the K.B.C. North Maharashtra University, Jalgaon]

STATEMENT OF MARKS

Diploma in Bioinformatics (CGPA Pattern)

Examination held in May 2019

Student Name : More Kalyani Bhagwantrao

College Name : R. C. Patel Arts Commerce and Science College, Shirpur

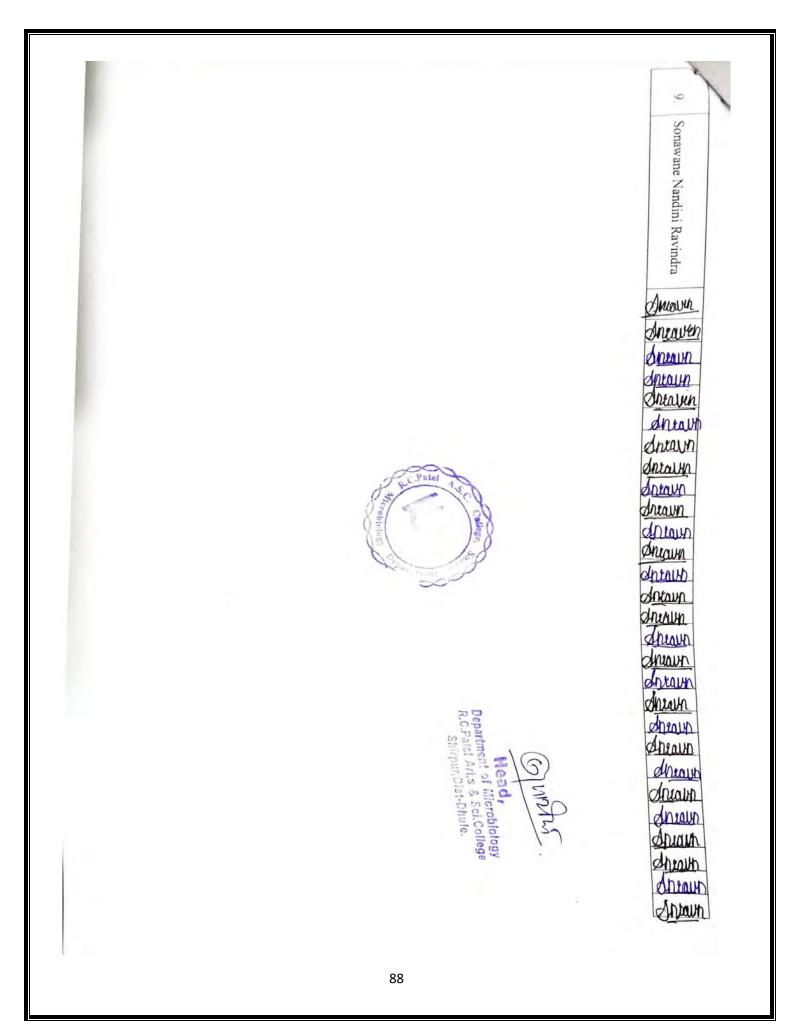
Seat Number : 191209

Exam Centre : Shirpur (240051)

Paper Code	Paper Name	AM	Credits (Max.)	Marks Obtained
DBI 101	Cell Biology, Genetics and Immunology	тн	6.0	86
DBI 102	Essentials of Bioinformatics	ТН	6.0	82
DBI 103	Lab Course	PR	8.0	82

Result: Pass	CGPA: 5.25	Grade: A
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	SOIOS	Co-ordinator
Abbreviations:	a sta	1000
	P: Pass, F: Fail, AB: Absent, RR: Result Re	eserved, TH: Theory,
PR: Practical, O: Outstandin		(,,,,,

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College R. C. Patel Arts, Commerce and Science College, Shirpur

> Name of career oriented course Diploma in Plant Tissue Culture

> > Faculty SCIENCE

Academic year (2018-19)

North Maharashtra University, Jalgaon Ordinance 181

College name	:	R. C. Patel Arts, Commerce and Science College, Shirpur
Title of the course	:	Diploma in Plant Tissue Culture
Aims/Objective of the course	:	To make students acquaint about methods in plant tissue culture and their applications.
Duration of the course	:	1 Year
Fees structure	:	Rs. 1000/-
Course structure	:	Paper I: Plant Biotechnology
		Paper II: Plant Tissue Culture
		Paper III: Lab Course
Eligibility for admission	:	Certificate Course in Plant Tissue Culture

Skeleton of course:

Sr	Paper	Name of subject	Theory /	Teachi ng	Maximum marks allotted			P	Passing		Credit
No			Practic al		hours	Extern al	Inter nal	Total	Exter nal	Inte rnal	Total
7.	DPTC-101	Plant Biotechnology	Theory	90	60	40	100	24	16	40	6
8.	DPTC-102	Plant Tissue Culture	Theory	90	60	40	100	24	16	40	6
9.	DPTC-103	Lab course	Practical	120	60	40	100	24	16	40	8

Minimum staff	:	03	
Mode of examination		:	Internal and external
			(Theory and Practical)
Detail syllabus		:	Syllabus copy attached
			90

DPTC 101: Plant Biology

Topics	Lectures allotted
1. Plant tissue culture and some related aspects	
1.1 Biovillage concept: Qualifications required to join the training	15
course, Employment for rural youth	
1.3 Efforts of public research institutes	
1.4 Production criteria and economics: Selection of crops for	
micropropagation, Selection of location	
1.5 Planning for production: Multirate, Passage, Operator efficiency	
2. Germplasm Conservation and Storage	
2.1 Introduction	15
2.2 Approaches for germplasm conservation: In-situ Conservation	
and Ex-situ Conservation	
2.3 Germplasm conservation in the form of seeds	
2.4 In-vitro methods for germplasm conservation	
2.5 Applications of germplasm storage	
2.6 Limitations of germplasm storage	
3. Plant tissue culture and Cryopreservation	
3.1 Introduction	15
3.2 Technique used in cryopreservation	
3.3 Development of sterile tissue cultures	
3.4 Addition of cryoprotectants and pretreatment	
3.5 Freezing, Storage, Thawing	
3.6 Reculture, Measurement of viability and Plant regeneration	
4. Eco-Social Impact of Genetically Modified Crops	
4.1 Legal rights in the new biotechnology: Patent	15
4.2 Impacts on Farmers and Consumers, Ethical and Practical Problems	
4.3 Transgenic plants: Risk, Benefits and Impact on Society and	
Environment	

4.4 Transgenics and Human wealth

5. Agrobiotechnology and its Applications

- 5.1 Improvement of crop yield and quality: Green revolution
- 5.2 Genetic manipulations of fruit ripening,
- 5.3 Preventation of discolouration, flower pigmentation
- 5.4 Male sterility
- 5.5 Genetic Engineering for increasing vitamins, amino acids & minerals
- 5.6 Commercial transgenic crop plants

6. Plant tissue culture and forestry

- 6.1 Introduction and History
- 6.2 Scope of tissue culture in forestry.
- 6.3 Applications of PTC in forestry.

References:

- 1. Introduction to biotechnology: S. S. Purohit.
- 2. Biotechnology: U. Satyanarayana
- 3. Kalyan Kumar De, Plant tissue culture.

15

Topics	Lectures allot
. Preparation of Media	
1.1 Media components	
1.2 Preparation of Stock solutions	15
1.3 Preparation of Media	15
1.4 Media mixing	
Aseptic Techniques and preparation of Explants	
2.1 Sterilization of Plant Tissues	15
2.2 Control of Bacterial and Fungal Contaminants by antibiotics	
2.3 Pretreatment to explant	
2.4 Age of explant2.5 Size of explant	
Methods of sterilization and Disinfectation	
a. Effectiveness of antimicrobial agent activity: Population size, population	15
composition, Concentration of antimicrobial agent, exposure time, Temperature	
b. Sterilization: Moist Heat, Dry Heat, Filtration, Radiation	
c. Disinfection: Chemical disinfectants, Classification of Chemical	
Disinfectants	
Organogenesis:	
4.1 Introduction	15
4.2 What is embryo culture?	
4.3 Different categories of embryo culture and their objectives.	
4.4 Principle and protocol.	
4.5 Applications.	
Cell – Suspension culture:	
5.1 Definition	15
5.2 Principle	
5.3 Protocol	
5.4 Importance of cell suspension culture. Embryo culture Organogenesis:	
6.1 Introduction	15
6.2 Principle and Protocol.	15
6.3 Factors affecting organogenesis.	
6.4 Applications of organogenesis	
0.4 Applications of organogenesis	

- 1. Kalyan Kumar De, Plant tissue culture.
- 2. Plant tissue culture, S.S.Bhojwani and M.K. Rajdhan.
- 3. Plant tissue culture, S.S. Purohit.

DPTC 103: Lab Course

Sr. No.	Lab course	Lee	ctures allotted
1.	Sterile methods in plant tissue culture.		12
2.	Isolation of Agrobacterium		12
3.	Isolation of chloroplast from spinach leaves.		12
4.	Isolation of plant DNA		12
5.	Estimation of Plant DNA		12
6.	Estimation of carotenoids.		12
7.	Cell suspension culture		12
8.	Study of Leaf Culture		12
9.	Study of Ovary Culture		12
10.	Study of embryo culture.		12
		Total	120

References:

- 1) Kalyan Kumar De, Plant tissue culture.
- 2) Biotechnology books and experiment handbooks. Harisha



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R. C. Patel Arts, Commerce & Science College, Shirpur (Affiliated to the K.B.C. North Maharashtra University, Jalgaon)

STATEMENT OF MARKS

Diploma in Plant Tissue Culture (CGPA Pattern)

Examination held in May 2019

Student Name : Sonawane Nandini Ravindra

College Name : R. C. Patel Arts Commerce and Science College, Shirpur

Seat Number : 192209

Exam Centre : Shirpur (240051)

Paper Code	Paper Name	AM	Credits (Max.)	Marks Obtained
DPTC 101 Plant Biology		TH	6.0	92
DPTC 102	Plant tissue Culture	TH	6.0	90
DPTC 103	Lab Course	PR	8.0	90

 Result: Pass
 CGPA: 6.10
 Grade: O

 Abbreviations:
 Grade: O
 Grade: O

 AM: Assessment Methods, P: Pass, F: Fail, AB: Absent, RR: Result Reserved, TH: Theory,

PR: Practical, O: Outstanding Grade

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Bepartment of Microbiology R.C.Patel Art,s & Sci.College Shirpur,Dist-Dhule. (GIMPLE)

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K.B.C. North Maharashtra University, Jalgaon Ordinance 181

College R. C. Patel Arts, Commerce and Science College, Shirpur

Name of career oriented course Advance Diploma in Bioinformatics

Faculty SCIENCE

Academic year (2018-19)

98

K.B.C. North Maharashtra University, Jalgaon Ordinance 181

College name	:	R. C. Patel Arts, Commerce and Science College, Shirpur
Title of the course	:	Advance Diploma in Bioinformatics
Aims/Objective of the course	:	To make students acquainted about methods in Bioinformatics and their applications in life sciences
Duration of the course	:	1 Year
Fees structure	:	Rs. 1000/-
Course structure	:	Paper I: Genetic Engineering & Molecular Biology
		Paper II: Advances of Bioinformatics
		Paper III: Lab Course
Eligibility for admission	:	Diploma in Bioinformatics

Skeleton of course:

Sr Paper		Name of subject	Theory /	Teac hing		mum n allotted		P	assing		Credit
No	Ĩ		Practical	hour s	Extern al	Inter nal	Total	Exter nal	Inte rnal	Total	
10.	ADBI-101	Molecular Genetics & Bio-Engineering	Theory	90	60	40	100	24	16	40	6
11.	ADBI-102	Advances in Structural Bioinformatics	Theory	90	60	40	100	24	16	40	6
12.	ADBI-101	Lab course	Practical	120	60	40	100	24	16	40	8

Minimum staff	:	03
Mode of examination	:	Internal and external
		(Theory and Practical)
Detail syllabus	:	Syllabus copy attached
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ADBI 101: Molecular Genetics and Bio-Engineering

Topics	Lectures allotted
Topics	(in hrs)
Unit I: Nucleic acid Chemistry	
1.1 Structural aspects – Components of DNA and RNA,	
1.2 Nucleosides & Nucleotides (introduction, structure & bonding),	
1.3 Double helical structure of DNA (Watson-Crick model), various forms of DNA	15
1.4 Structure of RNA (Primary, Secondary & Tertiary)	
1.5 Central dogma of molecular biology	
Unit II: Molecular apparatuses	
2.1 DNA polymerase	
2.2 RNA polymerase and its types	20
2.3 DNA topology	20
2.4 Topoisomerase (Types and Mechanism)	
2.5 Vectors	
Unit III: Basics in genetic engineering 3.1 Basic principles of genetic engineering 3.2 Open reading frames	15
3.3 Restriction enzymes and its types	
Unit IV:Advances in genetic engineering	
4.1 DNA Sequencing Methods (Dideoxynucleotide sequencing	
4.2 Chemical degradation method)	
4.3 Protein sequencing	
4.4 DNA microarrays	15
4.5 Human genome project	15
4.6 PCR (Principle and basic protocol variations and	
applications)	
4.7 Genomic and cDNA libraries construction and their	
applications	
100	

Unit V: Analysis of sequence data	
5.1 Identification of gene functions and their products	15
5.2 Expression signals, SNP and EST	15
5.3 Protein motifs and domains	
Unit VI: Analysis of gene expression:	
6.1 Analyzing transcriptions (Northern blots, RT-PCR),	10
6.2 Translational analysis (western blots, 2D-electrophoresis)	
Total	90

ADBI 102: Advances in Structural Bioinformatics

Unit 1: Genomics 12 1.1 Genomics, Concept, approaches and methods 12 1.2 Genome mapping, determining sequence of a clone 1.3 Human genome project 1.4 Automated DNA sequencing. 08 2.1 Technology for protein expression analysis 08 2.1 Technology for protein expression analysis 08 2.1 Technology for protein expression analysis 08 2.2 Posttranslational modification 2.3 Protein-protein interactions Unit 3: Sequence alignment and algorithms 14 a. Study of similarities 14 b. Sequence alignment methods 12 c. Pairwise sequence alignment and programs for sequence alignment 12 4.1 Identification of motifs and domains in multiple sequence alignment 12 4.1 Identification of motifs and domains in multiple sequence alignment 12 5.1 Terminologies 12 5.2 Molecular evolution and Molecular phylogenetics 12 5.4 Gene phylogenetic tree construction 12 6.1 Distance based methods and character based methods 13 6.3 Phylogenetic tree evaluation 14 6.4 Phylogenetic programs – PHYLIP and DAMBE 10 7.1 NCBI – Entrez Human genome map viewer	Торіс	Lectures allotted
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8.3 Identifying the lead compound		
8.3 Identifying the lead compound	8.2 Target identification and validation	
107	102	

Το	tal 90
ADBI 103: Lab course	
Lab work	Periods allotte (in hrs)
Study SPDBV and Rasmol	8
Study of Molecular phylogeny (PHYLIP)	6
Study of ENTREZ search engine	6
Prediction of ORF using ORF finder	5
Determination of protein properties using NCBI	6
Study of human genome map viewer of NCBI	4
Analysis of protein and nucleic acids sequences	6
Accessing PubMed and PubMed Central	4
Study of Online Mendelian Inheritance in Man	10
Comparing and analyzing sequences using DAMBE.	8
Homology comparing using HomoloGene	10
Design PCR primers using online tools	4
Protein multiple sequence analysis using NCBI-COBALT	8
Studying phylogeny analysis	10

equence similarity searching (NCBI BLAST)		12
	Total	94

References:

- Cell biology, genetics, molecular biology, evolution and ecology by P. S. Verma and V. K. Agrawal, S. Chand Publ.
- 2. Friefielder D, (1993) Microbial Genetics, Jones & Bartlett Publishers, Inc.
- 3. Arora M. P. Sandhu G.S. "Genetics"
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- 5. Claverie J. M. & Notredame C. "Bioinformatics: A beginner's guide"
- Bioinformatics Concepts, Skills, Applications". S.C. Rastogi, Namita Mendiratta, Parag Rastogi.
- Bioinformatics: A Practical Guide to the Analysis of Genes and Proteins. Andrea's D. Baxevanis, B.F. Francis Ouellette.
- 8. Biological Sequence Analysis: Probabilistic Models of Proteins and Nucleic Acids. Richard Durbin et al.
- Computer Methods for Macromolecular Sequence Analysis. Doolittle R.F. (Ed.) (Methods in Enzymology, VOl. 266).
- 10. Shanmughavel, P. 2005. Principles of Bioinformatics, Pointer Publishers, Jaipur, India.
- 11. DNA and Protein Sequence Analysis. A Practical approach. Bishop M.J. Rawlings C.J. (Eds.).
- 12. Introduction to Bioinformatics. Teresa. K. Atwood and David J. Parry-Smith.
- 13. An introduction to Bioinformatics by vikramsingh, Narosa Publ.
- 14. Bioinformatics Computational Molecular Biology by Zvia Agur.
- 15. Basic Bioinformatics by Ignacimuthu.



R. C. Patel Educational Trust's

R. C. Patel Arts, Commerce & Science College, Shirpur (Affiliated to the K.B.C. North Maharashtra University, Jalgaon)

STATEMENT OF MARKS

Advanced Diploma in Bioinformatics (CGPA Pattern)

Examination held in May 2019

Student Name : Mahajan Ankita Vinod

College Name : R. C. Patel Arts Commerce and Science College, Shirpur

Seat Number : 191304

Exam Centre : Shirpur (240051)

Paper Code	Paper Name	AM	Credits (Max.)	Marks Obtained
ADBI 101	Genetic Engineering and Molecular Biology	TH	6.0	85
ADBI 102	Advances of Bioinformatics	TH	6.0	86
ADBI 103	Lab Course	PR	8.0	85

Result: Pass

CGPA: 5.60

COMM

Grade: A

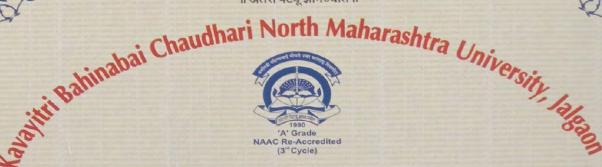
Co-ordinator

Abbreviations:

AM: Assessment Methods, P: Pass, F: Fail, AB: Absent, RR: Result Reserved, TH: Theory, PR: Practical, O: Outstanding Grade



॥ अंतरी पेटवू ज्ञानज्योत ॥



Jalgaon (M.S.), INDIA

We, the Board of Deans, Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon

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The Principal

R. C. Palel Aofs, commerce and science college, shippur

do, hereby, certify that,

24r./Ms. Ishi Bhagyashree Digamber

has pursued a course of study approved by the Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon and has passed the requisite examination held in may 2019 with A grade and found duly qualified for the award of

Advanced Diploma in

Bioinformatics

Which is conferred on him / her on October 1st, 2019 In testimony whereof is set the seal and signatures of authorities.



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Advanced Diploma in Bioinformatics 2018-19 Lecture attendance



K.B.C. North Maharashtra University, Jalgoan

Ordinance 181

R. C. Patel Arts, Commerce and Science College, Shirpur

Name of Career Oriented Course PG Diploma in Bioinformatics

Faculty SCIENCE

Academic year

(2018-19)

North Maharashtra University, Jalgoan

Ordinance 181

College name	:	R. C. Patel Arts, Science and Commerce College,Shirpur
Title of the course	:	Post graduate diploma in Bioinformatics
Aims/Objective of the course	:	To make students acquaint about current trends in the field of bioinformatics and its application in lifesciences.
Duration of the course	:	1 Year
Fees structure	:	Rs. 1500/-
Course structure	:	Paper I: Foundations in Life Sciences Paper II: Advances in Bioinformatics Paper III: Lab Course
Eligibility for admission	:	B.Sc. (Science) as per ordinance 181

Skeleton of course:

Sr.	r. Paper Name of		Theory / Practic	Teac hing]	aximu marks llotte	5		Passir	ng	Credi
No		subject	al	hour s	Exte rn al	Int er nal	Tot al	Ext er nal	Int e rn al	Tot al	t
1.	Paper I	Foundations in Life Sciences	Theory	90	60	40	100	74	16	40	6
		Sciences			00	40	100	<u> </u>	10	10	0
2.	Paper II	Advances in Bioinformatics	Theory	90	60	40	100	24	16	40	6
3.	Paper III	Lab course	Practical	120	60	40	100	24	16	40	8

Topic s	Lectures allotted (in hrs.)
Chemistry of Life	
• Chemistry of living organisms, atoms, elements, chemical bonds, comparison of enzymatic and non-enzymatic reactions.	
Study of biomolecules:	15
• Carbohydrates: Structure, classification	
• Proteins: properties of amino acids and peptides; structural levels of proteins; phi- and psi- angles in protein conformation.	
• Enzymes: EC number, enzyme nomenclature and classification; units of enzyme activity; allosteric enzymes.	
Genetics	
• Basics concepts of genetics: Bases, nucleotides, nucleosome, histones, genes, genomes.	
• RNA: Structure, function and types, mRNA splicing	15
• DNA: structure of B form of DNA; denaturation, renaturation kinetics, hybridization of DNA, circular and linear DNA.	
• Genome mapping and genome sequencing: Basics and significance	
Immuno-informatics	
• Immune system: Overview, Types: (innate and acquired)	
Antibody: Structure and function	
• MHC: MHC Peptide interaction, MHC I & II, Polymorphism	15
• B Cell and T Cell antigens: Characteristics and Importance	
• Immune response: CMI and humoral immune response	
• Bioinformatics in immunology: Background and significance invaccine development	

Topics	Lectures allotted(in hrs.)
Central Dogma of Molecular biology	
Nucleic Acid: Types and Structure	
• 16S RNA	
DNA topology	15
• DNA modifying enzymes	13
• RNA polymerase and its types	
Transcription: Mechanism	
• Translation: Mechanism	
Genomics & Proteomics	
 Study of organization of genomes, Genome sequencing techniques 	
• The Human Genome Project, Applications of genomics studies	15
• Introduction to proteomics, Metabolic pathways	
Post-translational Modification	
Protein–Protein Interactions	
Applications of proteomics studies	
Molecular Biology techniques	
Centrifugation and ultra-centrifugation	
• Gel electrophoresis	
• SEM and TEM	15
• TLC, HPTLC	
• HPLC	
• pH and pOH	
Total	90

PGDBI 102: Advances in Bioinformatics

Topics	Lectures allotted (in hrs.)
Bioinformatics Software	
• Study of Nucleic acid tools: Crustal W, ORF Finder, tools	08
at NCBI,CFSSP	Võ
Study of Protein tools: ExPaSy, tools at EBI, ProtParam, Crustal -Omega	
Biological databases	
Concept and classification of biological databases	
• Nucleic acid sequence databases: GenBank, EMBL, DDBJ	12
 Protein sequence databases: SwissProt, PIR, PDB 	
• EXPASY, SRS, ENTREZ	
Sequence alignments	
• Concept of single and multiple sequence alignment	
Sequence alignment methods	
Global and Local Alignment	
Multiple Sequence Alignment	15
Sequence alignment algorithms	
• Smith-Waterman algorithm	
Needelman-Wunsch Algorithm	
• Web-based sequence alignment tools	
Homology, phylogeny and evolutionary relationships	
• Concept of homology, similarity and identity	
• Phylogeny and evolutionary relationships	
Methods of phylogenetic analysis	10
• Phylogenetic trees	
• Tree-building methods	
• Use of Phylip and DAMBE in phylogenetic analysis	

Topics	Lectures allotted(in hrs)
Pharma informatics	
Drug discovery process	12
Target identification and validation	
Identifying and optimization of lead compound	
Analytical methods of nucleic acid and proteins	
Gene prediction strategies	
ORF finding methods	6
Protein function prediction strategies	U
Secondary structure prediction	
3D structure prediction of proteins	
Genome maps	
• Types of Genome maps and their uses,	
• Map elements,	12
• Types of maps: Cytogenetic, Linkage map, Transcript map, Physicalmap, Comparative map, integrated map.	
Map repositories	
• NCBI – Entrez Human genome map viewer	
• NCBI – Taxonomy browser	8
Human genome resources at ornl.gov	
OMIM – Online Mendelian Inheritance in Man	
Applications in Genomics and proteomics	
Genome mapping and Genome annotation	7
• Protein expression analysis - SAGE	,
• 2D gel electrophoresis	
Total	90

PGDBI 103: Lab course

Sr. No.	Lab work	Periods allotted
		(In hrs.)
1.	Study of online resources using Sequence Retrieval System: ENTREZ	6
2.	Study of online protein resources: PDB and PIR.	4
3.	Multiple sequence alignment using Clustal Omega.	8
4.	Protein sequence download and visualization using RsMol and SPDBV	4
5.	Prediction of possible ORF using NCBI ORF finder.	4
6.	Calculate physical, chemical parameters for proteins using ProtParam.	8
7.	Study of Global and local sequence alignments	4
8.	Study of Blast Tool At	
	Ncbi	8
	i. Use Blast in to identify the gene, the source organism	
	and analysis of BLAST result.	8
	ii. Identification of protein sequence by BLAST p.	6
	iii. Finding PCR primers specific for template DNA using NCBI's	
	Primer BLAST.	
9.	Study of services at EBI	
	i. Ensemble	6
		6
	ii. EBI metagenomics	8
	iii. Gene Wise	
10.	Study of UniProt tool of EBI	8
11.	Studying resources for molecular phylogeny.	
	i. Study of MEGA5 software.	6
	ii. Study of sequence editor software: BioEdit.	4
	iii. Visualizing phylogenetic tree using FigTree / TreeView.	4
12.	Studying molecular phylogeny using tool DAMBE.	8
13.	Explore study and use proteomics resources available at ExPaSy.	6
14.	Predicting possible genes in DNA sequence using NCBI- GLIMMER.	4
	Total	120

References:

- 1. Arora M. P. Sandhu G.S. "Genetics"
- 2. Claverie J. M. & Notredame C. "Bioinformatics: A beginner's guide"
- 3. Bioinformatics Concepts, Skills, Applications". S.C.

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4. Cell Biology, Genetics, Molecular Biology, Evolution and Ecology by P. S. Verma and

V. K. Agrawal, S. Chand Publ.

5. Bioinformatics: A Practical Guide to the Analysis of Genes and Proteins.

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- 6. Biological Sequence Analysis: Probabilistic Models of Proteins and Nucleic Acids. Richard Durbin et al.
- 7. Computer Methods for Macromolecular Sequence Analysis. Doolittle R.F. (Ed.)(Methods in Enzymology, VOI. 266).
- Shanmughavel, P. 2005. Principles of Bioinformatics, Pointer Publishers, Jaipur, India.
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- 13.Basic bioinformatics by Ignacimuthu.



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Lecture attendance PG Diploma in Bioinformatics 2018-19

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Read, Department of Microbiology R.C.Patel Art.s & Sci.College Shirpon, Dist-Dhule



R. C. Patel Educational Trust's R. C. Patel Arts, Commerce & Science College, Shirpur (Affiliated to the K.B.C. North Maharashtra University, Jalgaon)

STATEMENT OF MARKS

Post Graduate Diploma in Bioinformatics (CGPA Pattern)

Examination held in May 2019

Student Name : Pathan Muzammil Khan Mukhtar Khan

College Name : R. C. Patel Arts Commerce and Science College, Shirpur

Seat Number : 193104

Exam Centre : Shirpur (240051)

Paper Code	Paper Name	АМ	Credits (Max.)	Marks Obtained
PGDBI 101	Adnances in Life Sciences	TH	6.0	83
PGDBI 102	Bioinformatics	TH	6.0	88
PGDBI 103	Lab Course	PR	8.0	87

Result: Pass

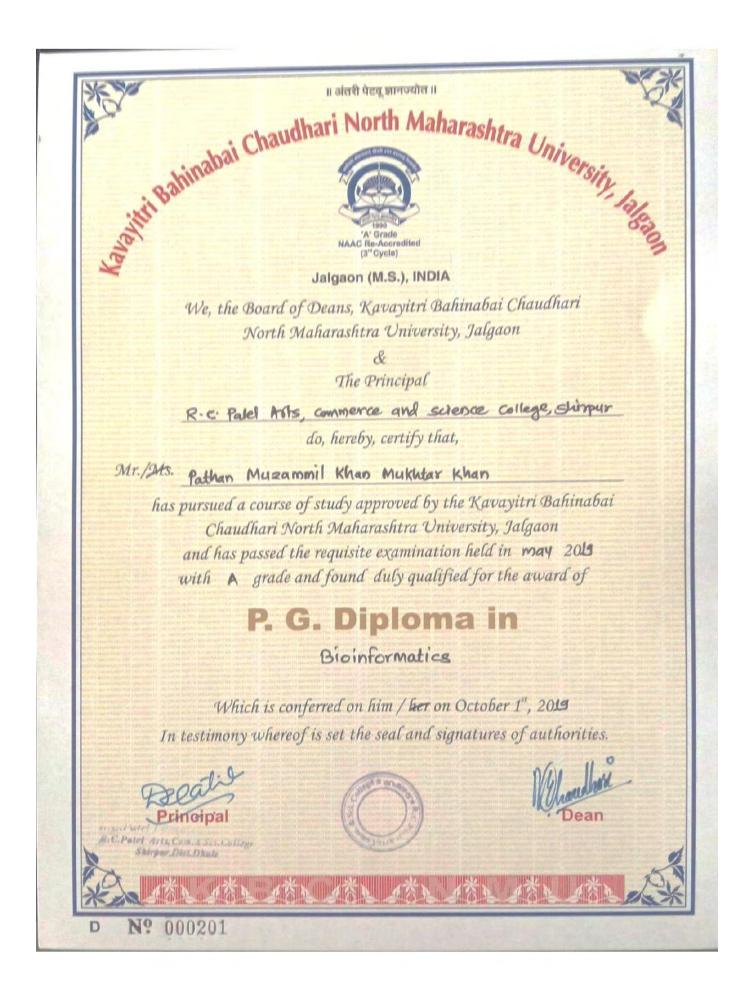
CGPA: 5.45

Grade: A

Co-ordinator

Abbreviations:

AM: Assessment Methods, P: Pass, F: Fail, AB: Abecnt, RR: Result Reserved, TH: Theory, PR: Practical, O: Outstanding Grade



K.B.C.North Maharashtra University, Jalgaon Ordinance 181

College R. C. Patel Arts, Commerce and Science College, Shirpur

Name of career oriented course Post Graduate Diploma in Microbial Biotechnology

Faculty SCIENCE

Academic year (2018-19)

K.B.C. North Maharashtra University, Jalgaon Ordinance 181

College name	:	R. C. Patel Arts, Science and Commerce College, Shirpur
Title of the course	:	Post graduate diploma in Microbial Biotechnology
Aims/Objective of the course	:	To make students acquaint about methods and techniques of industrial biotechnology and their applications
Duration of the course	:	1 Year
Fees structure	:	Rs. 1500/-
Course structure	:	Paper I: Essentials in Life Sciences Paper II: Advances in Industrial technology Paper III: Lab course
Eligibility for admission	:	B.Sc. (Science) as per ordinance 181

Skeleton of course:

Sr	Paper	Name of subject	Theory / Practic al	Teachi ng hours	Maximum marks allotted			Passing			Credit
No					Extern al	Inter nal	Total	Exter nal	Inte rnal	Total	
13.	Paper I	Essentials in Life Sciences	Theory	90	60	40	100	24	16	40	6
14.	Paper II	Advances in Industrial Technology	Theory	90	60	40	100	24	16	40	6
15.	Paper III	Lab course	Practical	120	60	40	100	24	16	40	8

Minimum staff : 03

Mode of examination : Internal and external

(Theory and Practical)

Detail syllabus : Syllabus copy attache

PGDMBT 101: Essentials in Life Sciences

Topics	Periods allotted	
Unit 1: Foundation in Microbiology:		
Microbial cells: Structure and organization, Microbial diversity with representative examples. Microbiology in the environment: water, sewage and air, environmental pollution and biodegradation.	15	
Unit 2: Microbial physiology and biochemistry:		
Microbial nutrition, Aerobic and anaerobic growth, Factors affecting on growth, growth kinetics, Biomolecules (Carbohydrates, Nucleic acids, Lipids), Glycolysis, Gluconeogenesis.	10	
Unit 3: Medical microbiology and immunology:		
Introduction to Medical Microbiology, Microbiology in human diseases, Introduction to immune system, Immunity, basic immunological techniques, immunodiagnostic methods with examples of applications, monoclonal antibodies.	15	
Unit 4: Fundamental of Molecular Biology:		
Structure and properties of DNA/RNA, replication, DNA mutations and repair, transcription, mRNA processing, translation, gene regulation: lac operon.	15	
Unit 5: Techniques in Molecular Biology:		
Hybridization techniques, DNA Microarray, Nucleic acid blotting techniques (Southern, Northern, Western), Electrophoresis: gel and SDS-PAGE	15	
Unit 6: Techniques in genetic Engineering:		
 Concept & Methods in microbial genetics: mutagenesis and screening, strain improvement, transgenic plants and animals. Principles of cloning, Introduction to cloning vectors, Construction of genomic and cDNA libraries, PCR and DNA-based diagnostic techniques, DNA sequencing, Site directed mutagenesis, Protein 	20	
structure - function relationship. Total	90	

PGDMBT 102: Advances in Industrial Technology

Topics	Periods Allotted	
Unit 1: Bioprocess technology:		
Fundamentals in Bioprocessing, Raw materials for bioprocessing, comparison of chemical and biochemical processing based on energetics and environmental issues. Development of inocula, kinetics of enzymatic and microbial processes, Optimization studies, sterilization of media, air and equipment, modes of cell cultivation, general principles of bioreactor design and their operation.	15	
Unit 2: Downstream processing:		
Introduction to Downstream processing. Separation and purification techniques, quality assurance testing, representative examples of microbial products, vaccines and vaccine development, immobilization of cells and enzymes: principles, methodology and applications, disintegration of cells, separation of solid and liquid phases, isolation and purification techniques for proteins and other products. eg., precipitation, adsorption, chromatographic separations, bio-affinity based methods.	30	
Unit 3: Biosafety and environmental monitoring:		
Biosafety: Introduction, Concept, Significance & Technology Environmental monitoring: Introduction, Concept, Significance & Technology Intellectual Property Rights in Biotechnology.	10	
Unit 4: Quality Control:	•	
Antimicrobial effectiveness Testing, Pyrogen Test, Sterility Test, Ames test, Microbial Assay (Antibiotic and Vitamins), Phenol Coefficient: (RW Test and Chick Martin Test), Minimum Inhibitory Concentration (MIC) (Tube Dilution and Gradient Plate Method), Kirby-Bauer Antibiotic Sensitivity Test and Synergistic effect of antibiotics, Microbial Limit Test (analysis of water, raw material, finished product, packaging material and Excipients) Environmental monitoring and area monitoring	25	
Unit 5: Quality Assurance:	•	
Calibration and Validation, Pharmaceutical audits, GMP and CGMP, FDA, WHO and other agencies Principles of QA, Reporting and documentation, Market surveillance and monitoring.	10	
Total periods	90	

PGDMBT 103: Lab course

Lab course	Periods allotted
1. Microbial Limit Test (analysis of water, raw material, finished	8
product, packaging material, Excipients)	
2. Sterility Test of Pharmaceutical Products	8
3. Growth Promotion test of Media	8
4. Antibiotic Assay (Turbidometric)	8
5. Vitamin Bioassay (Diffusion method)	8
6. Kirby-Bauer Antibiotic Sensitivity Test	6
7. Phenol Coefficient tests	4
8. Environmental monitoring, area monitoring	12
9. Minimum Inhibitory Concentration (Tube dilution Method)	10
10.Calibration and Validation	6
11. Pharmaceutical audits, GMP and CGMP, FDA, WHO and	8
other agencies	
12. Principles of QA	4
13. Reporting and documentation	4
14. Market surveillance and monitoring.	6
15. Project/Industrial training/Field work	20
Total	120

References:

- 1. Indian Pharmacoepia, 2010.
- 2. British Pharmacoepia, 2009.
- 3. United state Pharmacoepia, 2007.
- 4. Industrial Microbiology: Whitaker and Hall.
- 5. Microbial Biotechnology: Moorey Mu Young.
- 6. Biotechnology: Expanding Horizons: B.D. Singh.
- 7. Quality assurance in Microbiiology: Ramkaran. M.
- 8. Biochemistry: Lubert Stryer.
- 9. Recombinant DNA: J.D. Watson.
- 10. Gene Biotechnology, S. N. Jogdand
- 11. Biochemistry, Lodish, IVth Edn.
- 12. Process Biotechnology fundamentals, IInd Edn, Mukhopadhyay S N (2004)
- 13. Intellectual property rights on biotechnology, Singh K C. BCIL, New Delhi
- 14. Biotechnology and genomics, Gupta P K, Rastogi publications, India.



R. C. Patel Educational Trust's

R. C. Patel Arts, Commerce & Science College, Shirpur (Affiliated to the K.B.C. North Maharashtra University, Jalgaon)

STATEMENT OF MARKS

Post Graduate Diploma in Microbial Biotechnology (CGPA Pattern) **Examination held in May 2019**

Student Name : Shirsath Shital Mohan

College Name : R. C. Patel Arts Commerce and Science College, Shirpur

Seat Number : 191105

Exam Centre : Shirpur (240051)

Paper Code	Paper Name	AM	Credits (Max.)	Marks Obtained	
PGDMBT 101	Fundamentals in Microbiology, Immunology and Molecular Biology	TH	6.0	84	
PGDMBT 102	Industrial Technology	TH	6.0	86	
PGDMBT 103	Lab Course	PR	8.0	82	

Result: Pass CGP

Grade: A **Co-ordinator**

Abbreviations:

AM: Assessment Methods, P: Pass, F: Fail, AB: Absent, RR: Result Reserved, TH: Theory, PR: Practical, O: Outstanding Grade