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

R. C. Patel Educational Trust's
R. C. Patel Arts, Commerce and Science College
Karvand Naka, Shirpur 425405, Dist - Dhule, Maharashtra
☎: (02563) 299328
E-mail: principal@rcpasc.ac.in

President
Hon. Bhupeshbhai Patel
Principal
Dr. D. R. Patil

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

R. C. Patel Arts Commerce and Science College Shirpur ★ R. C. Patel Educational Trust's

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

Paper No.	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

CT101 – Basic Computing

Topics	Lectures Allotted (in hrs.)
1.Introduction to computer system Definition of computer, History of computers Block Diagram of Computer, Types of computer, Neumann machine Input Devices: Keyboard, Mouse, Scanner 1.4 Output Devices: Monitor, Printer, Plotter Memory: Primary Memory, RAM, ROM, EPROM, PROM, Secondary Memory, Hard Disk, Pen Drive Definition: Data, Information, Algorithm, Flowchart, Program, Hardware, And Software: System Software, Application, Software, Firmware, Interpreter, compiler Programming 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**

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

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

Certificate Course in Commerce for Textile Industry 2018-2019

Attendance sheet

Sr. No.	Name of Students	02/9/18	09/9/18	16/9/18	23/9/18	30/9/18	07/10/18	14/10/18	28/10/18	04/12/18	09/12/18	16/12/18	23/12/18	30/12/18	06/01/19	13/01/19	20/01/19	27/01/19	03/02/19	10/02/19	17/02/19	24/02/19	03/03/19	10/03/19	17/03/19
1.	Nikum Shubhangi Sanjay	GSW	GSW	GSW	GSW	GSW	GSW	GSW	GSW	Ab	GSW	GSW	GSW	GSW	GSW	GSW	GSW	GSW	GSW	GSW	GSW	GSW	GSW	GSW	GSW
2.	Patel Sapana Rajendra	SRP	SRP	SRP	Ab	SRP	SRP	SRP	SRP	SRP	SRP	SRP	SRP	SRP	SRP	SRP	SRP	SRP	SRP	SRP	SRP	SRP	SRP	SRP	SRP
3.	Bhamre Ashu Pravin	APB	APB	APB	APB	APB	APB	APB	APB	APB	APB	APB	APB	APB	APB	APB	APB	APB	APB	APB	APB	APB	APB	Ab	APB
4.	Patil Megha Milind	CRG	CRG	CRG	CRG	CRG	CRG	CRG	CRG	Ab	CRG	CRG	CRG	CRG	CRG	CRG	CRG	CRG	CRG	CRG	CRG	CRG	CRG	Ab	CRG
5.	Gawale Liladhar Ravindra	PMS	PMS	PMS	PMS	PMS	PMS	PMS	PMS	PMS	PMS	PMS	PMS	PMS	PMS	PMS	PMS	PMS	PMS	PMS	PMS	PMS	PMS	PMS	PMS
6.	Shinde Prathmesh Mahesh	BSPawar	BSPawar	BSPawar	Ab	BSPawar	BSPawar	BSPawar	BSPawar	BSPawar	BSPawar	BSPawar	BSPawar	BSPawar	BSPawar	BSPawar	BSPawar	BSPawar	BSPawar	BSPawar	BSPawar	BSPawar	BSPawar	BSPawar	BSPawar
7.	Pawar Bhavesh Sanjay	HPG	HPG	HPG	HPG	HPG	HPG	HPG	HPG	PPG	HPG	HPG	HPG	HPG	Ab	HPG	HPG	HPG	HPG	HPG	HPG	FPG	HPG	HPG	HPG
8.	Gujar Hitesh Prakash	SSP	SSP	SSP	SSP	SSP	SSP	SSP	SSP	SSP	SSP	SSP	SSP	SSP	SSP	SSP	SSP	SSP	SSP	Ab	SSP	SSP	SSP	SSP	SSP
9.	Patil Shubham Gokul	GAP	GAP	GAP	GAP	GAP	GAP	GAP	GAP	GAP	GAP	GAP	GAP	GAP	GAP	GAP	GAP	GAP	GAP	GAP	Ab	GAP	GAP	GAP	GAP
10.	Rajput Gaurav Ambalal																								
11.	Warude Neha Vilas	NPG	NPG	NPG	NPG	NPG	NPG	NPG	NPG		NPG	NPG	NPG	NPG	NPG	NPG	NPG	NPG	NPG	NPG	NPG	Ab	NPG	NPG	NPG
12.	Thakare Jayashri Nana	JNT	JNT	JNT	JNT	JNT	JNT	JNT	JNT	JNT	JNT	JNT	JNT	JNT	JNT	JNT	JNT	JNT	JNT	JNT	JNT	JNT	Ab	JNT	JNT

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	TH	6.0	86
CCCTI102	Communication English	TH	6.0	82
CCCTI 103	Lab Course	PR	8.0	82

Result: **Pass** CGPA: **5.25** 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 ॥

Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon

1990
'A' Grade
NAAC Re-Accredited
(3rd Cycle)

Jalgaon (M.S.), INDIA

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

&

The Principal

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

do, hereby, certify that,

Mr./Ms. Ahire Kirti Shamrao

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 'A' grade and found duly qualified for the award of

Certificate in

Commerce for Textile Industry

Which is conferred on him / her on October 1st, 2018

In testimony whereof is set the seal and signatures of authorities.

Principal

Principal
R. C. Patel Educational Trust's
R. C. Patel Arts, Comm. & Sci. College
Shirpur

Dean

A № 000958

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
- ✓ 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.
- ✓ 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

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

Sir,

I wish to get admitted to as Students for the -

Certificate Course on Cultural Heritage of India

PERTICULAR OF CANDIDATE

1	Name in Full (Surname First)	:	Pawara Priti Darasing
2	Father/Husband Name	:	Pawara Darasing Ratnya
3	Mother Name	:	Pawara Devakibai Darasing
4	Address for Correspondence	:	Darbadya Tal. Shirpur
5	Mob. No.	:	9421188290
6	Email Id	:	pdpawara72@gmail.com
7	Date of Birth	:	1/6/1997
8	Place of Birth	:	Darbadya
9	Category	:	ST
10	Family Annual Income	:	50000/-
11	Last qualified examination	:	12th Art
12	Marks obtained (out of total marks)	:	68 %

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

Place Shirpur Name of Student - Pawara Priti Darasing

Year of Course 2018-2019

Course Name: - Certificate Course on Cultural Heritage of India

Student Attendance with Signature

Sr. No	Student Name	Signature of Beneficial Student						
		7/1/2019	8/1/2019	9/1/2019	10/1/2019	11/1/2019	12/1/2019	14/1/2019
1	Gowale Mohini Dilip	MDGawale	MDGawale	MDGawale	MDGawale	MDGawale	MDGawale	MDGawale
2	Bhoi Bhagyashri Motilal	Bhoi	Bhoi	Bhoi	Bhoi	Bhoi	Bhoi	Bhoi
3	Patil Aachal Dilip	Apatil	Apatil	Apatil	Apatil	Apatil	Apatil	Apatil
4	Patil Nilesh Sayaji	NPatil	NPatil	NPatil	NPatil	NPatil	NPatil	NPatil
5	Koli Suresh Gulab	SGKoli	SGKoli	SGKoli	SGKoli	SGKoli	SGKoli	SGKoli
6	Pawara Suresh Telad	Suresh	Suresh	Suresh	Suresh	Suresh	Suresh	Suresh
7	Pawara Priti Dhaasing	PDP	PDP	PDP	PDP	PDP	PDP	PDP
8	Pawara Vikas Bihari	P.V.B	P.V.B	P.V.B	P.V.B	P.V.B	P.V.B	P.V.B
9	Borse Bhatsing Mahanika	BMB	BmB	BmB	BmB	BmB	BmB	BmB.
10	Shaikh Shahid Anis	Shahid	Shahid	Shahid	Shahid	Shahid	Shahid	Shahid
11	Dabhade Karan	Karn	Karn	Karn	Karn	Karn	Karn	Karn
12	Teli Sujit Sanjay	SSTeli	SSTeli	SSTeli	SSTeli	SSTeli	SSTeli	SSTeli
13	Koli Digambar Ananda	DAKoli	DAKoli	DAKoli	DAKoli	DAKoli	DAKoli	DAKoli
14	Koli Mayur Mohan	Mayur	Mayur	Mayur	Mayur	Mayur	Mayur	Mayur
15	Shirsath Pradip Sharma	शिरसाठ	शिरसाठ	शिरसाठ	शिरसाठ	शिरसाठ	शिरसाठ	शिरसाठ
16	Shaikh Arbaz A.	Arbaz	Arbaz	Arbaz	Arbaz	Arbaz	Arbaz	Arbaz
17	Pawara Saheloy4.	Pawas	Pawas	Pawas	Pawas	Pawas	Pawas	Pawas
18	Pawara Badal Pandit	Bawara	Bawara	Bawara	Bawara	Bawara	Bawara	Bawara
19	Pawara Dilip Dun	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
20	Pawara Raindra Rajan	Rare	Rare	Rare	Rare	Rare	Rare	Rare
21	Pawara Saraswati Bhupen	Saral	Saral	Saral	Saral	Saral	Saral	Saral
22	PATIL ASHWINI ADHAR	AAPHIL	AAPHIL	AAPHIL	AAPHIL	AAPHIL	AAPHIL	AAPHIL
23	Pawara Sunil Nandu	Bawara	Bawara	Bawara	Bawara	Bawara	Bawara	Bawara
24	Pawara Sandip Radiram	Sandip	Sandip	Sandip	Sandip	Sandip	Sandip	Sandip
25	Kumbhar Manisha Subhash	MSKumbhar	MSKumbhar	MSKumbhar	MSKumbhar	MSKumbhar	MSKumbhar	MSKumbhar

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

R.C.PATEL ARTS, COMM. AND SCI. COLLEGE SHIRPUR

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		

Result: Pass

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

R.C.PATEL ARTS,COMM.AND SCI.COLLEGE SHIRPUR

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 - Mandav 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 magnficent 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 Priti Darasing

Mandu - M.P.

सा विद्या या विमुक्तये

R. C. Patel Arts, Commerce and Science College

Shirpur, 425405

Affiliated to KBC North Maharashtra University, Jalgaon (M.S.), India

R.C PATEL EDUCATIONAL TRUST

CERTIFICATE

The Principal of R. C. Patel Arts, Commerce and Science College, Shirpur (M.S.) do hereby certify that, Mr. /Ms. Pawara Priti Darasing has pursued a Certificate course and passed the requisite examination held in May-2019 with O grade and found duly qualified. This certificate is awarded for successful completion of

Certificate Course

Cultural Heritage in India

Seal

Course Co-ordinator | Co-ordinator | Principal

Certificate No.: CC-01/20182007/2019/A

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**

Marks: **95**

Grade: **O**

R.C.PATEL ARTS,COMM.AND SCI.COLLEGE * SHIRPUR *

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**

3.1 Reporter 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**

4.1 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 **15**

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 **15**

6.1 Carbohydrates

6.2 Lipids

6.3 Protein quality improvement

References:

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
6. De K.K.,(1998) An introduction to Plant Tissue Culture, New central book agencyPvt.Ltd,Calcutta
7. 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

References:

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**

References:

1. Biotechnology procedures and experiments handbook, S.Harisha
2. Plant tissue culture, Kaylan Kumar De, New central book agency Pvt.Ltd., Calcutta
3. 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.
6. Vyas S.P. and Kohli D.V. (2002), Methods in Biotechnology and Bioengineering, CBSPublishers and Distributors, New Delhi.

Lecture attendance
Advanced Diploma in Plant Tissue Culture
2018-19

Name of Student	Date and Sign of Students																										
	15/7/18	19-7-18	20-7-18	23-7-18	24-7-18	25-7-18	26-7-18	3-8-18	4-8-18	5-8-18	9-8-18	10-8-18	15-8-18	16-8-18	17-8-18	19-8-18	20-8-18	21-8-18	22-8-18	25-8-18	27-8-18	29-8-18	1-9-18	2-9-18	3-9-18	04-9-18	08-09-18
Deshmukh Parth Jitendra		[signed]	[signed]		[signed]	[signed]	[signed]	[signed]		[signed]	[signed]	[signed]	[signed]		[signed]	[signed]	[signed]		[signed]	[signed]	[signed]	[signed]	[signed]		[signed]	[signed]	[signed]
Koli Anil Rajaram		[signed]	[signed]		[signed]	[signed]	[signed]	[signed]		[signed]	[signed]	[signed]	[signed]		[signed]	[signed]	[signed]		[signed]	[signed]	[signed]	[signed]	[signed]		[signed]	[signed]	[signed]

Head,
Department of Microbiology
R.C. ... Arts & Sci.College
Shirpur, 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

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

Result: **Pass**

CGPA: **5.45**

Grade: **A**

R.C.PATEL ARTS,COMM.AND SCI.COLLEGE SHIRPUR

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

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 allotted *(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 • Water and its properties • Bioenergetics: Laws of Thermodynamics and its Applications; Concept of free energy, Gibbs free energy.	**15**
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 • Concept of growth and different growth phases of bacteria • Microbial growth • Kinetics of growth	**25**
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 • **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	**33**
Genetic code and its properties	*2*
Total	**90**

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

- **Lab Work**

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

	6
16. Exploring nucleic acid sequence database and downloading in FASTA Format	**8**

References:

1. Dubey R.C. and Maheshwari D.K. 2004, Practical Microbiology, S.Chand and Co. Delhi.
2. Aneja K.R. (1996) Experiments in Microbiology, 3rd Edition Wishwa Prakashan,New Delhi.
3. 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

Sr. No.	Name of Student	Date and Sign of Students																								
		20-7-18	24-7-18	27-7-18	31-7-18	4-8-18	7-8-18	9-8-18	11-8-18	16-8-18	18-8-18	20-8-18	25-8-18	28-8-18	29-8-18	1-9-18	7-9-18	8/9/18	15/9/18	25/09/18	10/10/18	05/10/18	20/12/18	21/12/18	05/01/19	07/01/19
1.	Bagul Rutumbara Gajmal	Bagul	Bagul	Bagul	Bagul	Bagul	Bagul	Bagul	Bagul		Bagul	Bagul	Bagul		Bagul	Bagul		Bagul	Bagul	Bagul	Bagul	Bagul	Bagul	Bagul	Bagul	Bagul
2.	Bari Trupti Dipak				TDBari	TDBari	TDBari	TDBari	TDBari	TDBari	TDBari	TDBari	TDBari	TDBari	TDBari	TDBari	TDBari	TDBari		TDBari	TDBari	TDBari	TDBari	DBari	TDBari	TDBari	
3.	Baviskar Ashwini Pradip				A.P.B	A.P.B	A.P.B	A.P.B	A.P.B	A.P.B	A.P.B	A.P.B		A.P.B		A.P.B			A.P.B				A.P.B	A.P.B	A.P.B	A.P.B	A.P.B
4.	Bhamare komal Dattatray																									
5.	Bhavsar Harinakshi Sanjay																									
6.	Bhoge Tejal Santosh	BTS	BTS	BTS	BTS	BTS	BTS	BTS	BTS	BTS	BTS	BTS	BTS	BTS	BTS	BTS	BTS	BTS	BTS	BTS	BTS	BTS	BTS	BTS	BTS	BTS
7.	Borse Kajal Hirala																									
8.	Chambhar kajal Prakash																									

20.	Kumbhar Saloni Anil
21.	Mahale Sapna Sanjay
22.	Mali Kanchan Vilas
23.	Marathe Saurabh Eknath
24.	Mohite Amol Tukaram
25.	More Gaurav Ramesh
26.	Patil Akshay Dnyaneshwar
27.	Patil Apurva Nandkishor
28.	Patil Durgesh Dilip
29.	Patil Harshada Ravindra
30.	Patil Jagruti Bharat

31.	Patil Janhavi Jagdish
32.	Patil Jaya Kalidas
33.	Patil Jayashree Gulabrao
34.	Patil Pratiksha Jitendra
35.	Patil Vaibhavi Vijay
36.	Pawara Manoj Sakharam
37.	Saindane Rajkanya Yograj
38.	Savant Chetana Bhatu
39.	Shirsath Pallavi Sudarshan
40.	Sonali Ram Mali
41.	Sonawane Sneha dilip

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 ॥

Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon

1990
'A' Grade
NAAC Re-Accredited
(3rd Cycle)

Jalgaon (M.S.), INDIA

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

&

The Principal

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

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, 2018

In testimony whereof is set the seal and signatures of authorities.

Principal

R.C.Patel Arts,Comm.&Sci.College
Shirpur.Dist.Dhule 425 405

R.C.Patel Art's,Com.& Sci.College,Shirpur

Dean

A № 000923

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

Title of the Course : Certificate 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- Applied Chemistry for Textile Industries

Paper-II- Applied Chemistry of dyes & Auxiliaries

Paper-III- Lab Course

Eligibility for admission : Diploma course in Textile chemistry

Skeleton of Course :

Sr. No.	Paper	Name of the subject	Theory/ Practical Course	Teaching Hrs	Max. Marks Allotted			Passing			Credit
					External	Internal	Total	External	Internal	Total	
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

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

Details of Syllabus : Enclose the syllabus copy

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

CTC- 101- Applied Chemistry for Textile Industries

Paper-I THEORY Contact Hrs- 90

1. **Elementary Chemistry:** **(10 Hrs)**

   Concept of atom, atomic number, isotopes & isobars, molecular weight & equivalent weight, compounds & mixtures.

2. **Concepts in volumetric analysis:** **(20 Hrs)**

   Oxidizing & reducing agents, units of concentration, molarity, normality, formality, numerical, standard solutions, types.

3. **Acids & bases:** **(20 Hrs)**

   Arrhenius theory, Lewis theory & Lowry-Bronsted theory, properties & uses of acids & bases.

4. **Water:** **(10 Hrs)**

   Sources of water, impurities in water, hardness of water, temporary hardness, permanent hardness & effects.

5. **pH & pOH:** **(10 Hrs)**

   Introduction, concept, definition, calculation of pH value of acid, bases. Determination of pH by colorimetric method.

6. Industrial visit. **(20 Hrs)**

REFERENCE BOOKS:

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

For office use only

Application for the course – Cert. course Acad. Year: 2018-19

R. C. Patel Educational Trust's

R.C. Patel Arts, Commerce and Science College

Shirpur, Dist – Dhule, M.S. 425 405
(NAAC Accredited Institute)

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

Sir,

I wish to get admitted to as a student for the Cert. course in Tex. chem.

(Name and Signature of Candidate)

PARTICULARS OF CANDIDATE

1. Name in full (Surname first) : patil (Surname) prem (Name) sharad (Father's/Husband's Name)
2. Address for correspondence : A/p. ~~Phase~~ Fes Tal- shahada dist- Nandurbar
3. Email Id : Kunalpatil300236@gmail.com
4. Ph.No./Mobile No. : 9168300236
5. Father's/Husband's name with address : patil sharad Nimji
6. Sex (Male/Female) : Male
7. Nationality : Indian
8. Date of birth (dd/mm/yyyy) : 26/04/2000
9. Put the tick (✓) mark(s) in the appropriate box(es) applicable in your case.

SC	ST	DT	NT-1	NT-2	NT-3	SBC	OBC	OPEN	P.H.	D.S.P
							✓			

P.H. : Physically handicapped ; D.S.P. : Ward of Defense Service Person

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

Certificate Course in Textile Chemistry 2018-2019

Attendance shit

CTC - 101

No.	Name
1.	PATIL PRASHANT KRISHNA
2.	PATIL SAGAR KANTILAL
3.	ROKADE SAGARKUMAR RAJUBHAI
4.	SANKE SHITAL BANSILAL
5.	SURYAWANSHI DEVENDRA SURESH
6.	WANI YASHODWIP SUNIL
7.	WARULE SWAPNIL DADAJI
8.	PATIL PREM SHARAD
9.	PATIL GAURAV VIJAY
10.	GIRNAR MAHESH PRAKASH
11.	GUJAR BHAGYASHREE C.
12.	GUJAR RAJASHREE CHHAGAN
13.	THAKARE MAYUR MANOHAR
14.	WANI YASHODWIP SUNIL
15.	WARULE SWAPNIL DADAJI
16.	PATIL PREM SHARAD
17.	PATIL GAURAV VIJAY

R. C. Patel Arts, Comm. & Sci. Co. Shirpur

Mrs. Rajani B. Shah

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	TH	6	84
CTC-103	Lab Course	PR	8	87

Result: **Pass** CGPA: **5.30** Grade: **A**

R.C.PATEL ARTS,COMM.AND SCI.COLLEGE

Co-ordinator

Abbreviations:

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

Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon

'A' Grade
NAAC Re-Accredited
(3rd Cycle)

Jalgaon (M.S.), INDIA

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 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 1st, 2019

In testimony whereof is set the seal and signatures of authorities.

Principal

Principal
R.C.Patel Educational Trust's
R.C.Patel Arts,Comm. & Sci. College
Shirpur Dist.Dhule 425 405

Dean

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

Title of the Course : 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- Chemistry of Polymers in Textile Industries

Paper-II- Chemistry of Fibres in Textile Industries

Paper-III- Lab Course

Eligibility for admission : Certificate course in Textile chemistry

Skeleton of Course :

Sr. No.	Paper	Name of the subject	Theory/ Practical Course	Teaching Hrs	Max. Marks Allotted			Passing			Credit
					External	Internal	Total	External	Internal	Total	
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

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 THEORY Contact Hrs- 90

1. **Basic Determinants of Fibre Forming Polymers:** **(20 Hrs)**

   Importance of polymer science. Various applications of polymers. Classification of polymers. Definition of monomer, oligomer, high polymer, mesomer, cohesive energy density, solubility parameter, glass transition temperature, functionality and degree of polymerization.

2. **Condensation Polymerization:** **(15 Hrs)**

   Mechanism, types, featness, essential requirements and importance of condensation polymerization.

3. **Mechanism of Polymers:** **(20 Hrs)**

   Nomenclature, Dyestuff chemistry, Types of dyes & pigments, Manufacturing of dyes.

1. **Technology of Textile Polymers:** **(20 Hrs)**

   Characterization of polymers by different physical techniques such as DTA, DSC, TGA, IR, X-Ray diffraction

2. **Developments in polymers for textiles:** **(15 Hrs)**

   Synthetic polymers, Polymer waste and techniques of utilisation.

REFERENCE BOOKS:

1. Polymer science- V. R. Gowarikar
2. Natural Polymer man-made Fibres, Carrol and Porczynski C.Z., National Trade Press Ltd., London, 1965.
3. Visco-Elastic Properties of Polymers, Ferry, J.D., John Wiley and Sons, New York, 3rd edition, 1980.
4. Textbook of Polymer Science, Bill Meyer F.W., John 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, Classification, Characteristics of Fibres
2. **Fundamentals of Fibre Spinning-** **(20 Hrs)**
   General principles of the spinning process, Theory of solidification of polymer in various spinning techniques. Concept of melt spinning, general features and essential requirements of melt spinning.
3. **Polyester fibres:** **(20 Hrs)**
   Raw materials, manufacturing process, physical and chemical properties and end uses of polyester.
4. **Ployamide fibre:** **(20 Hrs)**
   Raw materials, manufacturing process, physical and chemical properties and end uses of Nylon-6 and Nylon-66.
5. **Commercial and rural importance of Natural fibres:** **(15 Hrs)**
   Cotton, wool, silk, ramie, jute, linen, pineapple, Natural Bamboo fibers, their occurrence, properties and uses.

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. 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

1. 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 Na_2SO_4.
9. To determine the purity percentage of $Na_2S_2O_4$.
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 P^{H} of water.
17. Purification of impure water by treatment.
18. Determination of TDS of water.

A-1000/-
E- 250/-
T- 1250/
Dt 14/7/18

For office use only Application for the course – Diploma course in Textilechem Acad. Year: 2018-19

R. C. Patel Educational Trust's

R.C. Patel Arts, Commerce and Science College

Shirpur, Dist – Dhule, M.S. 425 405
(NAAC Accredited Institute)

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

Sir,

I wish to get admitted to as a student for the Diploma course in Textile chem.

Patil
(Name and Signature of Candidate)

PARTICULARS OF CANDIDATE

1. Name in full (Surname first) : Patil (Surname) Sagar (Name) Prabhakar (Father's/Husband's Name)
2. Address for correspondence : At- Tajpuri Post Gaetad Tal- Shirpur Dist- Dhule.
3. Email Id : sagarpatil23499@gmail.com
4. Ph.No./Mobile No. : 8805543368
5. Father's/Husband's name with address : Patil Prabhakar Tryambak.
6. Sex (Male/Female) : M
7. Nationality : Indian
8. Date of birth (dd/mm/yyyy) : 23/04/1999
9. Put the tick (✓) mark(s) in the appropriate box(es) applicable in your case.

SC	ST	DT	NT-1	NT-2	NT-3	SBC	OBC	OPEN	P.H.	D.S.P
							✓			

P.H. : Physically handicapped ; D.S.P. : Ward of Defense Service Person

List of Admitted Students for **"Diploma Course in Textile Chemistry"**

For the Academic Year 2018 -19

Name of College: R. C. P. A.C. S. College, Shirpur
Name of Career Oriented Course: Diploma Course in Textile Chemistry
Academic Year: 2018-19
Intake Capacity: 60

Sr. No.	Name of Student	Gender	Category	Education Qualification	Year of passing	Presently admitted	Remark (if any)
1.	BHAMARE NILESH PRAKASH	Male	OBC	CTC	2018	S. Y. B. Sc.	
2.	CHAUDHARI KRISHNA PRAVIN	Male	OBC	CTC	2018	S. Y. B. Sc.	
3.	CHAUDHARI PARESH SHARAD	Male	OBC	CTC	2018	S. Y. B. Sc.	
4.	DESALE VISHAL KANHYALAL	Male	OBC	CTC	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	CTC	2018	S. Y. B. Sc.	
8.	PATEL RIYAJ FARUK	Male	OPEN	CTC	2018	S. Y. B. Sc.	
9.	PATEL VASUDEO BHARAT	Male	OBC	CTC	2018	S. Y. B. Sc.	
10.	PATIL AMOL ASHOK	Male	OBC	CTC	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	CTC	2018	S. Y. B. Sc.	
16.	PATIL YOGITA RAJENDRA	Female	OBC	CTC	2018	S. Y. B. Sc.	
17.	PAWAR YOGITA DEVIDAS	Female	OBC	CTC	2018	S. Y. B. Sc.	
18.	SONAWANE NISHA DHANRAJ	Female	OBC	CTC	2018	S. Y. B. Sc.	

*CTC = Certificate course in Textile Chemistry

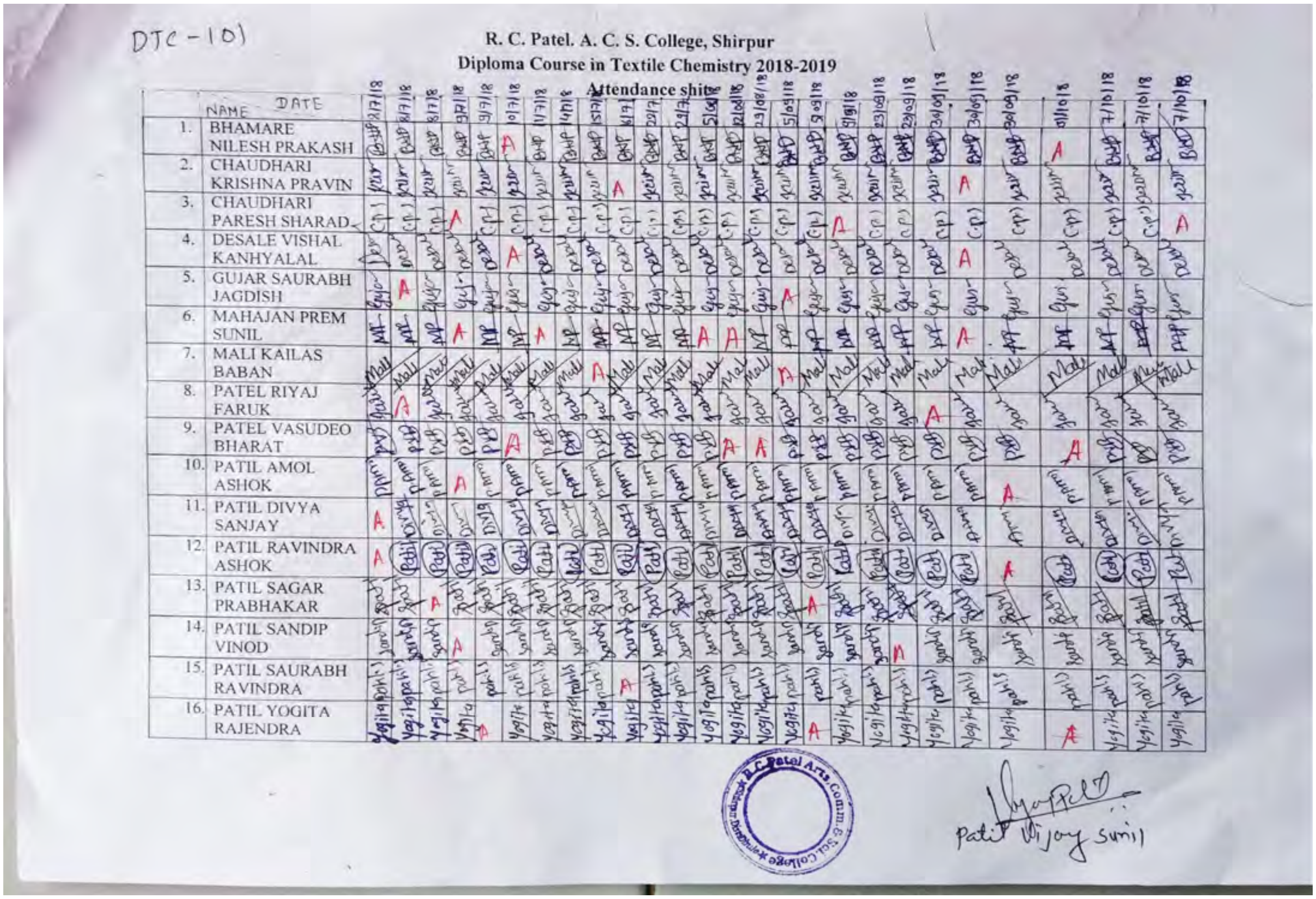
Certificate

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.

JPsonawan

Co-ordinator
Mr. Jayvant P. Sonawane

Principal
Dr. D. R. Patil



DTC - 101

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

Diploma Course in Textile Chemistry 2018-2019

Attendance shite

	NAME DATE
1.	BHAMARE NILESH PRAKASH
2.	CHAUDHARI KRISHNA PRAVIN
3.	CHAUDHARI PARESH SHARAD
4.	DESALE VISHAL KANHYALAL
5.	GUJAR SAURABH JAGDISH
6.	MAHAJAN PREM SUNIL
7.	MALI KAILAS BABAN
8.	PATEL RIYAJ FARUK
9.	PATEL VASUDEO BHARAT
10.	PATIL AMOL ASHOK
11.	PATIL DIVYA SANJAY
12.	PATIL RAVINDRA ASHOK
13.	PATIL SAGAR PRABHAKAR
14.	PATIL SANDIP VINOD
15.	PATIL SAURABH RAVINDRA
16.	PATIL YOGITA RAJENDRA

R. C. Patel Arts Comm. & Sci. College, Shirpur

Patil Vijay Sunil

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	TH	6	91
DTC-103	Lab Course	PR	8	95

Result: **Pass** CGPA: **6.30** Grade: **O**

R.C.PATEL ARTS,COMM.AND SCI.COLLEGE * SHIRPUR *

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 Industries Paper-III- Lab Course

Eligibility for admission: Diploma course in Textile chemistry

Skeleton of Course :

Sr. No.	Paper	Name of the subject	Theory/ Practical Course	Teaching Hrs.	Max. Marks Allotted			Passing			Credit
					External	Internal	Total	External	Internal	Total	
1	Paper-I	Polymers in Textile Industries	Theory	90	60	40	100	24	16	40	6
2	Paper-II	Chemistry	Theor	90	60	40	100	24	16	40	6

		in Textile Industries	**y**								
3	**Paper - III**	**Lab course**	**Practical**	120	60	40	100	24	16	40	6

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
2. Polymerization: (20 Hrs)
   Emulsion, dispersion, solution, synthetic production of Nylon, Polyester
3. Acids & bases: (20 Hrs)
   Arrhenius theory, Lewis theory & Lowry-Bronsted theory, properties & uses of acids &bases
4. Non-fibrous polymer: (15 Hrs)
   Introduction, chemistry of gum, starches, proteins, enzymes
5. Green Chemistry: (10 Hrs)
   Introduction, importance & need, green approaches in chemistry
6. Industrial visit (10 Hrs)

REFERENCE 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**

1. Surface active agents- (20 Hrs)
   Definition, surface activity, wetting, leveling and dispersing, types, characteristics &textile applications
2. **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: (15 Hrs)

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.

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.

For office use only Application for the course – ADC Acad. Year: 2018-19

R. C. Patel Educational Trust's

R.C. Patel Arts, Commerce and Science College

Shirpur, Dist – Dhule, M.S. 425 405
(NAAC Accredited Institute)

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

Sir,

I wish to get admitted to as a student for the Advanced Diploma Course in Pesticide Chemistry

A Chaudhari
Chaudhari Ankit Chagan
(Name and Signature of Candidate)

PARTICULARS OF CANDIDATE

1. Name in full (Surname first) : Chaudhari (Surname) Ankit (Name) Chagan (Father's/Husband's Name)
2. Address for correspondence : Borjot Ichorde
3. Email Id : chaudhariankit23@gmail.com
4. Ph.No./Mobile No. : 8389908509
5. Father's/Husband's name with address : Chaudhari Chagan Balu At Borjot Ichorde
6. Sex (Male/Female) : Male
7. Nationality : Indian
8. Date of birth (dd/mm/yyyy) : 07/05/1998
9. Put the tick (✓) mark(s) in the appropriate box(es) applicable in your case.

SC	ST	DT	NT-1	NT-2	NT-3	SBC	OBC	OPEN	P.H.	D.S.P
							✓			

P.H. : Physically handicapped ; D.S.P. : Ward of Defense Service Person

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

Advanced Diploma Course in Textile Chemistry 2018-2019

Attendance shit

(ADC-101) Sem

Sr.No.	Name of Students	4/08/18	5/08/18	6/08/18	7/8/18	9/8/18	10/8/18	11/8/18	22/8/18	23/8/18	5/9/18	7/9/18	8/9/18	11/9/18	13/9/18	25/9/18
1.	CHAUDHARI ANKIT CHHAGAN	ACC	ACC	ACC	ACC	ACC	ACC	ACC	ACC	ACC	ACC	ACC	ACC	ACC	ACC	ACC
2.	CHAUDHARI DATTARAJ SURESH	Chaudhari	Chaudhari	Chaudhari	Chaudhari	Chaudhari	Chaudhari	Chaudhari	Chaudhari	Chaudhari	Chaudhari	Chaudhari	Chaudhari	Chaudhari	Chaudhari	Chaudhari
3.	CHAUDHARI HITESH DATTU	HD	HD	HD	HD	HD	HD	HD	HD	HD	HD	HD	HD	HD	HD	HD
4.	CHAUDHARI NEHA AMBALAL	Neha	Neha	Neha	Neha	Neha	Neha	Neha	Neha	Neha	Neha	Neha	Neha	Neha	Neha	Neha
5.	CHAUDHARI PRIYANKA MOHAN	PMC	PMC	PMC	PMC	PMC	PMC	PMC	PMC	PMC	PMC	PMC	PMC	PMC	PMC	PMC
6.	CHAUDHARI ROSHANI SHARAD	Rosh	Rosh	Rosh	Rosh	Rosh	Rosh	Rosh	Rosh	Rosh	Rosh	Rosh	Rosh	Rosh	Rosh	Rosh
7.	GIRASE PRAMOD NARAYAN	Pramod	Pramod	Pramod	Pramod	Pramod	Pramod	Pramod	Pramod	Pramod	Pramod	Pramod	Pramod	Pramod	Pramod	Pramod
8.	MARATHE NITISHA BABULAL	Nitisha	Nitisha	Nitisha	Nitisha	Nitisha	Nitisha	Nitisha	Nitisha	Nitisha	Nitisha	Nitisha	Nitisha	Nitisha	Nitisha	Nitisha
9.	PATEL RINKAL SANJAY	Patel	Patel	Patel	Patel	Patel	Patel	Patel	Patel	Patel	Patel	Patel	Patel	Patel	Patel	Patel
10.	PATEL ROHIT SUDAM	Rohit	Rohit	Rohit	Rohit	Rohit	Rohit	Rohit	Rohit	Rohit	Rohit	Rohit	Rohit	Rohit	Rohit	Rohit
11.	PATEL VAIBHAV UTTAM	VUP	VUP	VUP	VUP	VUP	VUP	VUP	VUP	VUP	VUP	VUP	VUP	VUP	VUP	VUP
12.	PATIL DARSHANA VIJAY	Darshana	Darshana	Darshana	Darshana	Darshana	Darshana	Darshana	Darshana	Darshana	Darshana	Darshana	Darshana	Darshana	Darshana	Darshana
13.	PATIL KIRAN ISHWAR	Kiran	Kiran	Kiran	Kiran	Kiran	Kiran	Kiran	Kiran	Kiran	Kiran	Kiran	Kiran	Kiran	Kiran	Kiran
14.	PATIL MRUNAL NIMBA	Mrunal	Mrunal	Mrunal	Mrunal	Mrunal	Mrunal	Mrunal	Mrunal	Mrunal	Mrunal	Mrunal	Mrunal	Mrunal	Mrunal	Mrunal
15.	PATIL NIKITA VIJAY	Nikita	Nikita	Nikita	Nikita	Nikita	Nikita	Nikita	Nikita	Nikita	Nikita	Nikita	Nikita	Nikita	Nikita	Nikita
16.	PATIL SHIVPRASAD BHIKAN	Shiv	Shiv	Shiv	Shiv	Shiv	Shiv	Shiv	Shiv	Shiv	Shiv	Shiv	Shiv	Shiv	Shiv	Shiv
17.	SAINDANE SHUBHAM KAILAS	Shu	Shu	Shu	Shu	Shu	Shu	Shu	Shu	Shu	Shu	Shu	Shu	Shu	Shu	Shu
18.	SHIRSATH BHUSHAN SHIRISH	Bhus	Bhus	Bhus	Bhus	Bhus	Bhus	Bhus			Bhus		Bhus	Bhus		Bhus

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

Advanced Diploma Course in Textile Chemistry 2019-2020

Attendance shit

ADC-101 (Sem I)

Sr.No.	Name of Students	5/9/19	5/9/19	6/9/19	20/9/19	22/9/19	23/9/19	24/9/19	25/9/19	26/9/19	30/9/19	1/10/19	21/10/19	28/10/19	4/11/19
1.	BHAMARE NILESH PRAKASH	BNP	BNP	BNP	BNP	BNP	A	BNP	BNP	BNP	A	BNP	BNP	BNP	BNP
2.	CHAUDHARI KRISHNA PRAVIN	CKP	CKP	CKP	CKP	A	CKP	CKP	CKP	CKP	CKP	CKP	CKP	CKP	CKP
3.	CHAUDHARI PARESH SHARAD	CPS	CPS	CPS	CPS	CPS	CPS	CPS	CPS	CPS	CPS	CPS	A	A	CPS
4.	DESALE VISHAL KANHYALAL	DVK	DVK	DVK	DVK	DVK	DVK	DVK	DVK	DVK	DVK	DVK	DVK	DVK	A
5.	GUJAR SAURABH JAGDISH	GSJ	GSJ	GSJ	GSJ	GSJ	GSJ	A	A	GSJ	GSJ	GSJ	GSJ	GSJ	A	A
6.	MAHAJAN PREM SUNIL	PSM	PSM	PSM	PSM	PSM	A	PSM	PSM	PSM	A	PSM	A	PSM	A	PSM
7.	MALI KAILAS BABAN	MKB	MKB	MKB	MKB	MKB	MKB	A	MKB	MKB	MKB	A	MKB	MKB	MKB	
8.	PATEL RIYAJ FARUK	RFP	RFP	RFP	RFP	RFP	RFP	RFP	RFP	RFP	RFP	RFP	RFP	RFP	RFP	RFP
9.	PATEL VASUDEO BHARAT	PVB	PVB	PVB	PVB	PVB	PVB	PVB	PVB	PVB	PVB	PVB	PVB	PVB	PVB	A
10	PATIL AMOL ASHOK	PAA	PAA	PAA	PAA	PAA	PAA	PAA	PAA	A	A	PAA	PAA	A	PAA	A
11	PATIL RAVINDRA ASHOK	PRA	PRA	PRA	PRA	PRA	PRA	PRA	PRA	PRA	PRA	A	A	PRA	PRA	A
12	PATIL SAGAR PRABHAKAR	PSP	PSP	PSP	PSP	PSP	PSP	A	A	PSP	PSP	A	PSP	PSP		PSP
13	PATIL SANDIP VINOD	PSV	PSV	PSV	PSV	PSV	A	PSV	A	PSV	A	PSV		PSV	PSV	PSV
14	PATIL SAURABH RAVINDRA	PSR	PSR	PSR	PSR	PSR	PSR	PSR	PSR	PSR	PSR	PSR	PSR	A		PSR
15	PATIL YOGITA RAJENDRA	PYR	PYR	PYR	PYR	PYR	PYR	PYR	PYR	PYR	PYR	PYR	A	PYR	PYR	PYR
16	PAWAR YOGITA DEVIDAS	PYD	PYD	PYD	A	PYD	PYD	PYD	PYD	PYD	PYD	PYD	PYD	PYD	PYD	PYD
17	SONAWANE NISHA DHANRAJ	SND	SND	SND	SND	SND	SND	SND	SND	SND	SND	SND	SND	A	A	SND

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	TH	6	85
ADC-102	Chemistry in Textile industries	TH	6	82
ADC-103	Lab Course	PR	8	92

Result: **Pass** CGPA: **5.65** Grade: **A**

R.C.PATEL ARTS, COMM. AND SCI. COLLEGE SHIRPUR

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 ॥

Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon

1990
'A' Grade
NAAC Re-Accredited
(3rd Cycle)

Jalgaon (M.S.), INDIA

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 Pramod Narayan

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

Textile Chemistry

Which is conferred on him / her on October 1st, 2019

In testimony whereof is set the seal and signatures of authorities.

Principal

Principal
R.C.Patel Educational Trust's
R.C.Patel Arts,Comm. & Sci. College
Shirpur Dist.Dhule 425 405

R.C.Patel Arts, Comm. & Sci. College, Shirpur, Dist. Dhule

Dean

C Nº 000053

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	**:**	**XIIth**

Skeleton of course:

Sr No	Paper	Name of subject	Theory / Practical	Teaching hours	Maximum marks allotted			Passing			Credit
					External	Internal	Total	External	Internal	Total	
1.	Paper I	Gender and Education	Theory	90	60	40	100	24	16	40	6
2.	Paper II	Women Work and Employment	Theory	90	60	40	100	24	16	40	6
3.	Paper III	Field Work	Practical	120	60	40	100	24	16	40	8

CCWS 101: Gender and Education

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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. • National Committees and Commissions for Women.	22
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. • Recent Trends in Women's Education – Committees and Commissions on Education. • Vocational education and skill Development for women.	22
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. • Alternative Media – Folk Art, Street Play and Theatre. • Indecent Representation of Women (Prohibition) Act, 1986, Impact of media on women.	24
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. • Gender and emerging Technology – Impact. • Self-help Groups and Micro Credit. • Gender mainstreaming, Gender budgeting, planning and Analysis.	22

	Total	90

CCWS 102: Women Work and Employment

Topics	Lectures allotted (in hrs)
Unit – I Introduction to Women's Education • Women's Education – Gender bias in enrolment – Curriculum content – Dropouts. • Negative capability in Education – Values in Education – Vocational Education. • Recent Trends in Women's Education – Committees and Commissions on Education. • Adult Literacy and Non – formal education for women's development.	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 in organized and unorganized sector. • Training, skills and income generation. • New Economic Policy and its impact on Women's Employment – Globalization – Structural Adjustment Programs	22
Unit – III Women and Health • Gender in Health – Health status of women in India – Mortality and Morbidity factors influencing health – Nutrition and health – HIV and AIDS control programme. • National Health and Population Policies and Programmes – Maternal and Child Health (MCH) to Reproductive and Child health approaches, Issues of old age. • Women and Environment – Nature as feminine principle – Basic needs in Rural and Urban Environments – Care and management of natural resources – Depletion of natural resources – Sustainable environment and impact on women.	24
Unit – IV Women and Media • Role of women in media – Development of Communication Skills – Alternative Media – Folk Art, Street Play and Theatre – Women as change agents. • Indecent Representation of Women (Prohibition) act, 1986 – Impact of	24

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

For office use only

Application for the course – women study

2018-19
Acad. Year:

R. C. Patel Educational Trust's

R.C. Patel Arts, Commerce and Science College

Shirpur, Dist – Dhule, M.S. 425 405
(NAAC Accredited Institute)

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

Sir,

I wish to get admitted to as a student for the Badgujar Komal Bhatu

Badgujar Komal Bhatu

(Name and Signature of Candidate)

PARTICULARS OF CANDIDATE

1. Name in full (Surname first) : Badgujar (Surname) Komal (Name) Bhatu (Father's/Husband's Name)
2. Address for correspondence : 62, B. Mahavir colony Shirpur Tel Shirpur Dist : Dhule
3. Email Id : badgujar k70 @ gmail. com
4. Ph.No./Mobile No. : 8975545006
5. Father's/Husband's name with address : Badgujar bhatu dhudku
6. Sex (Male/Female) : Female
7. Nationality : Indian
8. Date of birth (dd/mm/yyyy) : 18-01-2000
9. Put the tick (✓) mark(s) in the appropriate box(es) applicable in your case.

SC	ST	DT	NT-1	NT-2	NT-3	SBC	OBC	OPEN	P.H.	D.S.P
							✓			

P.H. : Physically handicapped ; D.S.P. : Ward of Defense Service Person

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. No.	Students Name	Students Signature											
		27/8/18	28/8/18	29/8/18	24/9/18	25/9/18	26/9/18	8/10/18	9/10/18	10/10/18	31/12/18	4/12/18	5/12/18
	Khairnar Renuka Rajendra												
	Pathan Shehnaz												
	Patil priyanka Santosh												
	Girase Nikhe Gajendra												
	pawar dhanshri Sharad												
	Shinde Rajani Rajendra												
	Rajput Divya Rajendra												
	Patil Namrata Kishor												
	Patil Divya Nitin												
	Sanke Shital Bansilal												
	Mahajan Minakshi giri												
	Patil Shraddha Jagdish												
	Patil Mayan Uday												
	Patil Ashwini Kailash												
	Gujar Mayuri Sunil												
	Patil Aparna Namdev Kishor												

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	TH	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**

R.C.PATEL ARTS,COMM.AND SCI.COLLEGE

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 ॥

Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon

1990
'A' Grade
NAAC Re-Accredited
(3rd Cycle)

Jalgaon (M.S.), INDIA

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

&

The Principal

R.C. Patel Art's, commerce and science College, Shirpur

do, hereby, certify that,

Mr./Ms. Badgujar komal Bhatu.

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

Women Studies

Which is conferred on ~~him~~ / her on October 1st, 2019

In testimony whereof is set the seal and signatures of authorities.

Principal

Dean

KBCNMU

A № 003210

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	:	**12th Science**

Skeleton of course:

Sr No	Paper	Name of subject	Theory / Practical	Teaching hours	Maximum marks allotted			Passing			Credit
					External	Internal	Total	External	Internal	Total	
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

Topics	Lectures Allotted
1. Plant Cell:	
1.1 Plant cell organelles: structure and function Cell wall, plasma membrane, Endoplasmic reticulum, Vacuole, Golgi apparatus, Plastid & Nucleus 1.2 Storage granules 1.3 Osmosis: Role in turgidity 1.4 Homeostasis: concept and significance	12
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, Permeability. 2.3 Conservation of water	10
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-cyclic) 3.5 Dark reaction; C3 pathway or Blackmanns reaction or Calvin cycle 3.6 Significance of photosynthesis	12
4. 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, seeds and fruits 4.4 Morphogenesis, Juvenility, Totipotency 4.5 Media nutrients and requirements of growth	12
5. Plant Hormones:	
Concept of hormones and their role in Plant tissue culture 5.1 Auxins: introduction, Mechanism of action, use as herbicides 5.2 Cytokines: Introduction, Mechanism of Action, 5.3 Gibberellins: Introduction, Mechanism of action, commercial uses of Gibberellins 5.4 Ethylene: Introduction, Action, Role in flowering. 5.5 Abscisic acid (ABA): Introduction, Action, Role.	10
6. Plant diseases	
6.1 Citrus Canker Powdery mildew in apple 6.2 Whip Smuts of Sugarcane 6.3 Leaf spots in Tikka disease of groundnut	**12**

6.4 Rots in cucurbits

CCPTC 102: Basics in Plant Tissue Culture

Topics	Lectures allotted
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 Hormones, gelling agents 1.4 Media preparation and methods of sterilization	**14**
2. Totipotency and Cytodifferentiation:	
2.1 Totipotency: Introduction, Expression, significance 2.2 Cytodiffertiation: Introduction, Process, Factors affecting cytodifferentiation	**12**
3. Organ culture:	
Different types of organ culture (principle, protocol, and Importance) 3.1 Root culture 3.2 Leaf culture 3.3 Meristem; shoot tip culture, flower culture 3.4 Ovary culture 3.5 Anther and pollen culture	**14**
4. Callus culture:	
4.1 Callus culture: Introduction and principle 4.2 Characteristics of callus 4.3 Process of callus formation 4.4 Methods and significance of callus	**12**
5. Somatic embryogenesis:	
5.1 Somatic embryogenesis: Introduction and principle and Significance 5.2 Methods in somatic embryogenesis 5.3 Factors affecting on somatic embryogenesis 5.4 Artificial seeds: development and uses	**14**
6. Application of plant tissue culture:	
6.1 Micro propagation 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	**12**

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

Date and Sign of Students

Sr. No.	Name of Student	2-7-18	06-7-18	8-7-18	18-7-18	13-7-18	03-8-18	07-8-18	22-8-18	29-8-18	30-8-18	14-9-18	18-9-18	22-9-18	29-9-18
1.	Chaudhari Yogesh Sahebrao	Chaudhari	Chaudhari	AB	Chaudhari	Chaudhari	Chaudhari	Chaudhari	Chaudhari	Chaudhari	Chaudhari	Chaudhari	Chaudhari	Chaudhari	AB
2.	Deore Deepak Ishwar	Deore	Deore	Deore	Deore	Deore	Deore	Deore	Deore	Deore	Deore	Deore	Deore	AB	Deore
3.	Dhangar Vijay Samadhan	Dhangar	Dhangar	Dhangar	Dhangar	Dhangar	Dhangar	Dhangar	Dhangar	AB	Dhangar	AB	Dhangar	Dhangar	Dhangar
4.	Gavale Akash Murlidhar	Gavale	Gavale	Gavale	AB	Gavale	AB	Gavale	Gavale	AB	Gavale	Gavale	Gavale	Gavale	Gavale
5.	Kadam Karishma Mahendra	Kadam	Kadam	Kadam	Kadam	Kadam	Kadam	Kadam	Kadam	AB	Kadam	Kadam	Kadam	Kadam	Kadam
6.	Khatik Rihanshaik Riyaj	Khatik	Khatik	Khatik	Khatik	AB	Khatik	AB	Khatik	Khatik	Khatik	AB	Khatik	Khatik	AB
7.	Khatik Sohil Aashik	Khatik	Khatik	Khatik	Khatik	Khatik	AB	Khatik	Khatik	Khatik	Khatik	Khatik	Khatik	Khatik	Khatik
8.	Marathe Mohit Ganesh	Marathe	Marathe	Marathe	Marathe	Marathe	AB	Marathe	Marathe	Marathe	Marathe	Marathe	Marathe	Marathe	Marathe

Sr. No.	Name of Student	3-9-18	14-9-18	3-10-18	10-10-18	15-10-18	17-10-18	27-10-18	24-10-18	1-12-18	3-12-18	5-12-18	11-1-18	14-1-19	7-1-19
1.	Chaudhari Yogesh Sahebrao	Chaudhari	Chaudhari	Chaudhari	Chaudhari	AB	Chaudhari	Chaudhari	Chaudhari	AB	Chaudhari	Chaudhari	AB	Chaudhari	AB
2.	Deore Deepak Ishwar	Deore	Deore	Deore	Deore	Deore	Deore	AB	Deore	AB	Deore	Deore	Deore	AB	Deore
3.	Dhangar Vijay Samadhan	Dhangar	Dhangar	Dhangar	Dhangar	Dhangar	Dhangar	Dhangar	Dhangar	AB	Dhangar	AB	Dhangar	Dhangar	Dhangar
4.	Gavale Akash Murlidhar	Gavale	Gavale	AB	Gavale	Gavale	AB	Gavale	Gavale	AB	Gavale	AB	Gavale	Gavale	Gavale
5.	Kadam Karishma Mahendra	Kadam	Kadam	Kadam	Kadam	Kadam	Kadam	AB	Kadam	Kadam	Kadam	Kadam	AB	Kadam	AB
6.	Khatik Rihanshaik Riyaj	Khatik	Khatik	Khatik	AB	Khatik	Khatik	Khatik	Khatik	AB	Khatik	AB	Khatik	AB	Khatik
7.	Khatik Sohil Aashik	Khatik	AB	Khatik	AB	Khatik	Khatik	Khatik	Khatik	Khatik	Khatik	Khatik	Khatik	Khatik	Khatik
8.	Marathe Mohit Ganesh	Marathe	Marathe	Marathe	Marathe	Marathe	Marathe	Marathe	Marathe	AB	Marathe	Marathe	Marathe	AB	AB

9.	More Mayuri Bhikanrao	
10.	More Pankaj Sanjeev	
11.	Patel Miral Rajesh	
12.	Pathan Muzammil Khan Mukhtar Khan	
13.	Patil Bhagyashri Pradip	
14.	Patil Janhavi Nitin	
15.	Patil Jayashri Ramesh	
16.	Patil Priyanka Sudhakar	
17.	Patil Rohit Jagan	
18.	Pawar Bhumeshwari Dnyandev	

Head,
Department of Biotechnology
R.C.Patel Arts & Sci.College
Shirpur,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

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	AM	Credits (Max.)	Marks Obtained
CCPTC 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**

R.C.PATEL ARTS,COMM.AND SCI.COLLEGE * SHIRPUR *

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 ॥

Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon

1990
'A' Grade
NAAC Re-Accredited
(3rd Cycle)

Jalgaon (M.S.), INDIA

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

&

The Principal

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

do, hereby, certify that,

Mr./Ms. Pathan Muzammil Khan Mukhtar Khan

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

Plant tissue culture

Which is conferred on him / ~~her~~ on October 1st, 2019

In testimony whereof is set the seal and signatures of authorities.

Principal

R.C. Patel Educational Trust's
R.C. Patel Arts, Com. & Sci. College
Shirpur, Dist. Dhule

Dean

A № 003209

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 No	**Paper**	**Name of subject**	**Theory / Practical**	**Teaching hours**	**Maximum marks allotted**			**Passing**			**Credit**
					External	Internal	Total	External	Internal	Total	
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 allotted (in hrs)
Cell Organization: Prokaryotic cell: Structure & Organelles Plant cell: Structure & Organelles Animal cell: Structure & Organelles Golgi apparatus RER and SER Mitochondria Plastids, vacuole Nucleus Endoplasmic reticulum	15
Basics in Genetics: Concept of genes and genome Chromosome: Structure and composition (Histones & Nucleosome) Mutation: Concept and types (Point, nonsense, frameshift, transitions, transversions)	15
Cell Cycle: Mitosis: Introduction, Steps, significance Meiosis: Introduction, Steps, significance Differences Mitosis & Meosis	15
Central Dogma of Molecular Biology : DNA replication : Details of replication : Initiation, Elongation, Termination Transcription : Details of transcription : Initiation, Elongation, Termination Translation: Details of translation: Initiation, Elongation, Termination	15
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 Concept of Antibody: Structure, types and functions (IgA, IgG, IgM. IgD and IgE) Overview of immune responses: CMI and humoral immune response	30
Total	**90**

DBI 102: Fundamentals of Bioinformatics

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 Alignment algorithms: Dynamic methods: Needleman-Wunsch algorithm, Smith-Waterman algorithm; Heuristic methods: FASTA, BLAST; Multiple sequence alignments: ClustalW, ClustalX; PSI-BLAST: BLAST searches	30
Gene studies Introduction to Gene prediction strategies Basics in Exon prediction Background in Protein prediction strategies Basics in Coding sequence prediction Tools available for prediction of gene	15
Proteins alignments Background of Protein structure alignments Secondary structure prediction strategies Three-dimensional structure determination Comparison of protein structures Different structure alignment algorithms	20
Data mining NCBI resources SRS OMIM tool ENTREZ search engine Advanced search UniProt	10
Outline to tools ClustalOmega ClustalW MEGA5 Phylip package JMol SPDBV Mol-Mol	15
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**
Practical 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	TH	6.0	86
DBI 102	Essentials of Bioinformatics	TH	6.0	82
DBI 103	Lab Course	PR	8.0	82

Result: **Pass**

CGPA: **5.25**

Grade: **A**

R.C.PATEL ARTS, COMM. AND SCI. COLLEGE SHIRPUR

Co-ordinator

Abbreviations:

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

Lecture attendance
Diploma in Bioinformatics
2018-19

Sr. No.	Name of Student	Date and Sign of Students
1.	Bachchhav Shubham Raju	2-7-18
2.	Bhairav Unnati Sunil	24-7-18
3.	Bhamre Dipmala Alankar	26-7-18
4.	Chaudhari Alpesh Ashok	29-7-18
5.	Chaudhari Harshal Vijay	1-8-18
6.	Chaudhari Parth Sanjay	2-8-18
7.	Chaudhari Prajwal Surendra	7-8-18
8.	Deore Darshana Raju	13-8-18
		14-8-18
		16-8-18
		21-8-18
		22-8-18
		23-8-18
		24-8-18
		26-8-18
		27-8-18
		28-8-18
		29-8-18
		2-9-18
		3-09-18
		4-09-18
		5-09-18
		6-09-18
		7-09-18
		8-9-18
		9-9-18
		15-9-18
		16-9-18

9.	Sonawane Nandini Ravindra	Absent

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

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 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 No	Paper	Name of subject	Theory / Practical	Teaching hours	Maximum marks allotted			Passing			Credit
					External	Internal	Total	External	Internal	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

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 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	**15**
2. Germplasm Conservation and Storage	
2.1 Introduction 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	**15**
3. Plant tissue culture and Cryopreservation	
3.1 Introduction 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	**15**
4. Eco-Social Impact of Genetically Modified Crops	
4.1 Legal rights in the new biotechnology: Patent 4.2 Impacts on Farmers and Consumers, Ethical and Practical Problems 4.3 Transgenic plants: Risk, Benefits and Impact on Society and Environment	**15**

4.4 Transgenics and Human wealth	
5. Agrobiotechnology and its Applications	
5.1 Improvement of crop yield and quality: Green revolution	**15**
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.	**15**

References:

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

DPTC 102: Advances in Plant Tissue Culture

Topics	Lectures allotted
1. Preparation of Media	
1.1 Media components 1.2 Preparation of Stock solutions 1.3 Preparation of Media 1.4 Media mixing	**15**
2. Aseptic Techniques and preparation of Explants	
2.1 Sterilization of Plant Tissues 2.2 Control of Bacterial and Fungal Contaminants by antibiotics 2.3 Pretreatment to explant 2.4 Age of explant 2.5 Size of explant	**15**
3. Methods of sterilization and Disinfectation	
a. Effectiveness of antimicrobial agent activity: Population size, population composition, Concentration of antimicrobial agent, exposure time, Temperature b. Sterilization: Moist Heat, Dry Heat, Filtration, Radiation c. Disinfection: Chemical disinfectants, Classification of Chemical Disinfectants	**15**
4. Organogenesis:	
4.1 Introduction 4.2 What is embryo culture? 4.3 Different categories of embryo culture and their objectives. 4.4 Principle and protocol. 4.5 Applications.	**15**
5. Cell – Suspension culture:	
5.1 Definition 5.2 Principle 5.3 Protocol 5.4 Importance of cell suspension culture.	**15**
6. Embryo culture Organogenesis:	
6.1 Introduction 6.2 Principle and Protocol. 6.3 Factors affecting organogenesis. 6.4 Applications of organogenesis	**15**

References:

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	Lectures 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

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 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**

R.C.PATEL ARTS,COMM.AND SCI.COLLEGE SHIRPUR

Co-ordinator

Abbreviations:

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

Lecture attendance

Diploma in Plant tissue Culture

2018-19

Sr. No.	Name of Student	Date and Sign of Students																												
		AB	31/10	7/11/18	14/11/18	17/11/18	24/11/18	30/11/18	5/12/18	11/12/18	18/12/18	21/12/18	27/12/18	4/1/19	11/1/19	14/1/19	17/1/19	7/1/19	11/1/19	18/1/19	26/1/19	31/1/19	4/2/19	11/2/19	14/2/19	20/2/19					
1.	Dhangar Akshay Parshuram	Dhange	Akshay	Akshay	Akshay	AB	Akshay	Akshay	Akshay	Akshay	Akshay	Akshay	AB	Akshay	AB	AB	Akshay	Akshay	Akshay	Akshay	Akshay	Akshay	Akshay	Akshay	AB	Akshay	Akshay			
2.	Kadhare Tejaswini Vijay	AB	Tejas	Tejas	AB	AB	Tejas	AB	AB	AB	AB	Tejas	AB	Tejas	AB	AB	Tejas	AB	AB	Tejas	Tejas	Tejas	AB	Tejas	AB	AB	AB			
3.	Mahajan Sakshi Anil	MSA	MSA	MSA	AB	AB	MSA	AB	MSA	MSA	MSA	MSA	AB	MSA	MSA	MSA	MSA	MSA	MSA	MSA	MSA	MSA	MSA	MSA	MSA	AB	AB			
4.	Mirza Beg Saima Parveen Muquaddar Beg	AB	Mbaima	Mbaima	Mbaima	Mbaima	Mbaima	AB	Mbaima	Mbaima	Mbaima	Mbaima	Mbaima	AB	Mbaima	Mbaima	Mbaima	Mbaima	AB	AB	Mbaima	Mbaima	Mbaima	AB	Mbaima	Mbaima	AB			
5.	Nabeel Ahesan Ijazoddin	AB	NAA	NAA	NAA	NAA	NAA	NAA	NAA	NAA	NAA	NAA	NAA	AB	NAA	AB	NAA	NAA	NAA	NAA	NAA	NAA	AB	NAA	NAA	NAA				
6.	Pathan Bushra Aqueel Khan	AB	Reeb	Reeb	AB	Reeb	Reeb	AB	Reeb	Reeb	Reeb	Reeb	Reeb	Reeb	AB	AB	Reeb	Reeb	Reeb	Reeb	Reeb	Reeb	AB	Reeb	Reeb	Reeb				
7.	Patil Darshani Vikram	Dpatil	Dpatil	Dpatil	Dpatil	Dpatil	Dpatil	AB	Dpatil	Dpatil	Dpatil	Dpatil	Dpatil	Dpatil	Dpatil	Dpatil	Dpatil	Dpatil	Dpatil	Dpatil	Dpatil	Dpatil	Dpatil	AB	Dpatil	Dpatil	AB			
8.	Sonar Purushottam Somnath	AB																								AB				

7.	Patel Runali Chhotubhai	AB	R.C.Patel	R.C.Patel	AB	R.C.Patel	AB	R.C.Patel	R.C.Patel	AB	R.C.Patel	R.C.Patel	AB	AB	R.C.Patel	AB	R.C.Patel	R.C.Patel	AB	R.C.Patel	AB	R.C.Patel	AB	R.C.Patel	AB	R.C.Patel	AB	R.C.Patel	AB
8.	Pawar Snehal Narendra	AB	AB	Pawar	Pawar	Pawar	Pawar	Pawar	Pawar	Pawar	Pawar	Pawar	Pawar	Pawar	Pawar	Pawar	Pawar	Pawar	Pawar	Pawar	Pawar	Pawar	Pawar	Pawar	Pawar	Pawar	Pawar	Pawar	Pawar
9.	Rajput Anuradha Harpalsing	AHRajput	AB	AHRajput	AHRajput	AHRajput	AHRajput	AHRajput	AHRajput	AHRajput	AB	AHRajput	AHRajput	AB	AHRajput	AHRajput	AHRajput	AHRajput	AB	AHRajput	AHRajput	AB	AHRajput	AHRajput	AHRajput	AB	AHRajput	AB	AHRajput
10.	Sonawane Ashwini Sanjay	A.Sonwane	A.Sonwane	A.Sonwane	A.Sonwane	A.Sonwane	A.Sonwane	A.Sonwane	A.Sonwane	A.Sonwane	A.Sonwane	A.Sonwane	A.Sonwane	A.Sonwane	A.Sonwane	A.Sonwane	A.Sonwane	A.Sonwane	A.Sonwane	A.Sonwane	A.Sonwane	A.Sonwane	A.Sonwane	A.Sonwane	A.Sonwane	A.Sonwane	A.Sonwane	A.Sonwane	A.Sonwane
11.	Sonawane Nikita Ravindra	Nikita	Nikita	Nikita	Nikita	Nikita	Nikita	Nikita	Nikita	Nikita	Nikita	Nikita	Nikita	Nikita	Nikita	Nikita	Nikita	Nikita	Nikita	Nikita	Nikita	Nikita	Nikita	Nikita	Nikita	Nikita	Nikita	Nikita	Nikita

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

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

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)

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 No	Paper	Name of subject	Theory / Practical	Teaching hours	Maximum marks allotted			Passing			Credit
					External	Internal	Total	External	Internal	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

ADBI 101: Molecular Genetics and Bio-Engineering

Topics	Lectures allotted (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 1.4 Structure of RNA (Primary, Secondary & Tertiary) 1.5 Central dogma of molecular biology	15
Unit II: Molecular apparatuses 2.1 DNA polymerase 2.2 RNA polymerase and its types 2.3 DNA topology 2.4 Topoisomerase (Types and Mechanism) 2.5 Vectors	20
Unit III: Basics in genetic engineering 3.1 Basic principles of genetic engineering 3.2 Open reading frames 3.3 Restriction enzymes and its types	15
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 4.5 Human genome project 4.6 PCR (Principle and basic protocol variations and applications) 4.7 Genomic and cDNA libraries construction and their applications	15

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

ADBI 102: Advances in Structural Bioinformatics

Topic	Lectures allotted (in hrs)
Unit 1: Genomics 1.1 Genomics, Concept, approaches and methods 1.2 Genome mapping, determining sequence of a clone 1.3 Human genome project 1.4 Automated DNA sequencing.	12
Unit 2: Proteomics 2.1 Technology for protein expression analysis 2.2 Posttranslational modification 2.3 Protein sorting 2.4 Protein-protein interactions	08
Unit 3: Sequence alignment and algorithms a. Study of similarities b. Sequence alignment methods c. Pairwise sequence alignment d. Needleman-Wunsch algorithm and Smith-Waterman algorithm **e.** Multiple sequence alignment and programs for sequence alignment	14
Unit 4: Protein motifs and domain prediction 4.1 Identification of motifs and domains in multiple sequence alignment 4.2 motif and domain databases using regular expressions 4.3 Protein family databases.	12
Unit 5: Phylogenetic analysis 5.1 Terminologies 5.2 Molecular evolution and Molecular phylogenetics 5.4 Gene phylogeny and secies phylogeny 5.6 Forms of phylogenetic tree.	12
Unit 6: Phylogenetic tree construction 6.1 Distance based methods and character based methods 6.3 Phylogenetic tree evaluation 6.4 Phylogenetic programs – PHYLIP and DAMBE	12
Unit 7: Online Map repositories 7.1 NCBI – Entrez Human genome map viewer 7.2 OMIM – Online Mendelian Inheritance in Man	10
Unit 8: Drug discovery and pharmainformatics 8.1 Discovering a drug 8.2 Target identification and validation 8.3 Identifying the lead compound	10

8.4 Optimization, pharmainformatics		
	Total	**90**

ADBI 103: Lab course

Lab work	**Periods allotted (in hrs)**
Study SPDBV and Rasmol	8
Study of Molecular phylogeny (PHYLIP)	6
Study of ENTREZ search engine	6
Prediction of ORF using ORFfinder	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

Determine sequence relationship using Needleman-Wunsch algorithm	7
Sequence similarity searching (NCBI BLAST)	12
Total	**94**

References:

1. 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"
4. Arora M. P. "Biotechnology"
5. Claverie J. M. & Notredame C. "Bioinformatics: A beginner's guide"
6. Bioinformatics - Concepts, Skills, Applications". S.C. Rastogi, Namita Mendiratta, Parag Rastogi.
7. 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.
9. 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** Grade: **A**

R.C.PATEL ARTS,COMM.AND SCI.COLLEGE SHIRPUR

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 ॥

Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon

1990
'A' Grade
NAAC Re-Accredited
(3rd Cycle)

Jalgaon (M.S.), INDIA

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

&

The Principal

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

do, hereby, certify that,

Mr./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.

Principal

R. C. Patel Educational Trust's
R. C. Patel Arts, Com. & Sci. College
Shirpur, Dist. Dhule

Dean

C Nº 000039

Lecture attendance

Advanced Diploma in Bioinformatics

2018-19

Sr. No.	Name of Student							Date and Sign of Students
1.	Gawale Darshana Rohidas	AB	AVmahajan	MSJadhav	BDishi	KNIngale	DRGawale	05/07	18
2.	Ingale Krupa Nitin	AB	AVmahajan	AB	BDishi	KNIngale	DRGawale	06/07	18
3.	Ishi Bhagyashree Digamber	AB	AVmahajan	MSJadhav	BDishi	KNIngale	DRGawale	09/07	18
4.	Jadhav Manjusha Sanjay	AB	AVmahajan	AB	AB	KNIngale	DRGawale	15/07	18
5.	Mahajan Ankita Vinod	1	AB	MSJadhav	BDishi	AB	DRGawale	28/07	18
6.	Mali Dhiraj Sanjay	AB	AVmahajan	MSJadhav	BDishi	KNIngale	DRGawale	05/08	18
		AB	AVmahajan	MSJadhav	BDishi	KNIngale	DRGawale	08/08	18
		AB	AVmahajan	MSJadhav	AB	KNIngale	DRGawale	09/08	18
		AB	AVmahajan	AB	AB	AB	DRGawale	16/08/18	18
		AB	AVmahajan	MSJadhav	BDishi	KNIngale	DRGawale	22/08/18	18
		AB	AB	AB	BDishi	KNIngale	DRGawale	28/08/18	
		AB	AVmahajan	MSJadhav	BDishi	KNIngale	DRGawale	30/08/18	
		AB	AVmahajan	MSJadhav	AB	AB	AB	05/09/18	
		AB	AB	AB	AB	KNIngale	DRGawale	08/09/18	
		AB	AVmahajan	MSJadhav	BDishi	KNIngale	DRGawale	09/09/18	
		AB	AVmahajan	AB	BDishi	AB	AB	10/10/18	
		AB	AVmahajan	MSJadhav	AB	KNIngale	DRGawale	19/10/18	
		AB	AVmahajan	MSJadhav	AB	AB	DRGawale	25/10/18	
		AB	AVmahajan	MSJadhav	AB	KNIngale	AB	04/12/18	
		AB	AVmahajan	AB	AB	KNIngale	DRGawale	08/12/18	
		AB	AVmahajan	MSJadhav	AB	KNIngale	DRGawale	13/12/18	
		AB	AVmahajan	MSJadhav	AB	AB	AB	05/01/19	
		AB	AVmahajan	AB	AB	KNIngale	AB	08/01/19	
		AB	AB	MSJadhav	AB	KNIngale	DRGawale	12/01/19	
		AB	AVmahajan	MSJadhav	AB	AB	DRGawale	23/01/19	
		AB	AVmahajan	AB	AB	AB	DRGawale	05/02/19	
		AB	AB	AB	BDishi	KNIngale	AB	07/02/19	

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. No	**Paper**	**Name of subject**	**Theory / Practical**	**Teaching hours**	**Maximum marks allotted**			**Passing**			**Credit**
					External	Internal	Total	External	Internal	Total	
1.	Paper I	Foundations in Life Sciences	Theory	90	60	40	100	24	16	40	6
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

PGDBI 101: Foundations in Life Sciences

Topics	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:**
  • **Carbohydrates:** Structure, classification
  • **Proteins:** properties of amino acids and peptides; structural levelsof proteins; phi- and psi- angles in protein conformation.
  • **Enzymes:** EC number, enzyme nomenclature and classification;units of enzyme activity; allosteric enzymes.
	15

Genetics • **Basics concepts of genetics:** Bases, nucleotides, nucleosome,histones, genes, genomes. • **RNA:** Structure, function and types, mRNA splicing • **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	**15**
Immuno-informatics • **Immune system:** Overview, Types: (innate and acquired) • **Antibody:** Structure and function • **MHC**: MHC Peptide interaction, MHC I & II, Polymorphism • **B Cell and T Cell antigens:** Characteristics and Importance • **Immune response:** CMI and humoral immune response • **Bioinformatics in immunology:** Background and significance invaccine development	**15**

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

PGDBI 102: Advances in Bioinformatics

Topics	Lectures allotted (in hrs.)
Bioinformatics Software • Study of Nucleic acid tools: Crustal W, ORF Finder, tools at NCBI,CFSSP • Study of Protein tools: ExPaSy, tools at EBI, ProtParam, Crustal -Omega	**08**
Biological databases Concept and classification of biological databases • Nucleic acid sequence databases: GenBank, EMBL, DDBJ • Protein sequence databases: SwissProt, PIR, PDB • EXPASY, SRS, ENTREZ	**12**

Sequence alignments
• Concept of single and multiple sequence alignment
• Sequence alignment methods
  • Global and Local Alignment
  • Multiple Sequence Alignment
• Sequence alignment algorithms
  • Smith-Waterman algorithm
  • Needelman-Wunsch Algorithm
• Web-based sequence alignment tools
	15

Homology, phylogeny and evolutionary relationships • Concept of homology, similarity and identity • Phylogeny and evolutionary relationships • Methods of phylogenetic analysis • Phylogenetic trees • Tree-building methods • Use of Phylip and DAMBE in phylogenetic analysis	**10**

Topics	Lectures allotted(in hrs)
Pharma informatics • Drug discovery process • Target identification and validation • Identifying and optimization of lead compound	**12**
Analytical methods of nucleic acid and proteins • Gene prediction strategies • ORF finding methods • Protein function prediction strategies • Secondary structure prediction • 3D structure prediction of proteins	**6**
Genome maps • Types of Genome maps and their uses, • Map elements, • Types of maps: Cytogenetic, Linkage map, Transcript map, Physicalmap, Comparative map, integrated map.	**12**
Map repositories • NCBI – Entrez Human genome map viewer • NCBI – Taxonomy browser • Human genome resources at ornl.gov • OMIM – Online Mendelian Inheritance in Man	**8**
Applications in Genomics and proteomics • Genome mapping and Genome annotation • Protein expression analysis - SAGE • 2D gel electrophoresis	**7**
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 i. Use Blast in to identify the gene, the source organism and analysisof BLAST result. ii. Identification of protein sequence by BLAST p. iii. Finding PCR primers specific for template DNA using NCBI's Primer BLAST.	**8** **8** **6**
9.	Study of services at EBI i. Ensemble ii. EBI metagenomics iii. Gene Wise	**6** **6** **8**
10.	Study of UniProt tool of EBI	**8**
11.	Studying resources for molecular phylogeny. i. Study of MEGA5 software. ii. Study of sequence editor software: BioEdit. iii. Visualizing phylogenetic tree using FigTree / TreeView.	**6** **4** **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. Rastogi, Namita Mendiratta,Parag Rastogi.
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. Andréa’s D. Baxevanis, B.F. Francis Ouellette.
6. Biological Sequence Analysis: Probabilistic Models of Proteins and NucleicAcids. Richard Durbin et al.
7. Computer Methods for Macromolecular Sequence Analysis. Doolittle R.F. (Ed.)(Methods in Enzymology, VOl. 266).
8. Shanmughavel, P. 2005. Principles of Bioinformatics, Pointer Publishers, Jaipur,India.
9. DNA and Protein Sequence Analysis. A Practical approach. Bishop M.J.Rawlings C.J. (Eds.).
10. Introduction to Bioinformatics. Teresa. K. Atwood and David J. Parry-Smith.
11. An introduction to bioinformatics by Vikramsingh, Narosa Publ.
12. Bioinformatics - Computational Molecular Biology by Zvia Agur.
13. Basic bioinformatics by Ignacimuthu.

Lecture attendance

PG Diploma in Bioinformatics

2018-19

Sr. No.	Name of Student	Date and Sign of Students																								
		10 July 18	12 July 18	15 July 18	19 July 18	20 July 18	28 July 18	01 Aug 18	02 Aug 18	04 Aug 18	18 Aug 18	22 Aug 18	9 Sep 18	11 Sep 18	18 Sep 18	20 Sep 18	24 Sep 18	5/10/18	7/10/18	11/10/18	20/10/18	24/10/18	5/12/18	13/12/18	17/12/18	31/12/18	3/Jan-19	13-Jan-19	23-Jan-19
1.	Bhavsar Shruti Sunil																											
2.	Chaudhari Yogesh Sahebrao																											
3.	Girnar Dipti Dhurandhar																											
4.	Gurav Mahesh Ashok																											
5.	Navle Sneha Vilas																											
6.	Pathan Muzammil Khan Mukhtar Khan																											
7.	Patil Karishma Yashvant																											

8.	Patil Mahesh Prakash
9.	Patil Pradip Chhagan
10.	Patil Rupali Vilas
11.	Pawara Gaytri Panilal
12.	Salunkhe Shweta Vikas
13.	Shimpi Rupesh Gopal
14.	Sonar Aditi Rsjendra
15.	Verma Anupama Omprakash

Head,
Department of Microbiology
R.C.Patel Art.s & Sci.College
Shirpur,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	AM	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**

R.C.PATEL ARTS,COMM.AND SCI.COLLEGE SHIRPUR

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 ॥

Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon

1990
'A' Grade
NAAC Re-Accredited
(3rd Cycle)

Jalgaon (M.S.), INDIA

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

&

The Principal

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

do, hereby, certify that,

Mr./Ms. Pathan Muzammil Khan Mukhtar Khan

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*

P. G. Diploma in

Bioinformatics

Which is conferred on him / ~~her~~ on October 1st, 2019

In testimony whereof is set the seal and signatures of authorities.

Principal

R.C. Patel Arts, Com. & Sci. College
Shirpur Dist. Dhule

Dean

D № 000201

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 No	Paper	Name of subject	Theory / Practical	Teaching hours	Maximum marks allotted			Passing			Credit
					External	Internal	Total	External	Internal	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 structure - function relationship.	**20**
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 product, packaging material, Excipients)	**8**
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 other agencies	**8**
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**

CGPA: **5.25**

Grade: **A**

R.C.PATEL ARTS,COMM.AND SCI.COLLEGE SHIRPUR

Co-ordinator

Abbreviations:

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