



P P SAVANI
UNIVERSITY
SCHOOL OF SCIENCES

STUDENT HANDBOOK
2018-19



P P SAVANI
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ABOUT THE UNIVERSITY

P.P. Savani Education Trust was launched in 1987, initially with a school, which over the year expanded itself with a group of schools in Surat district with student strength of more than 45,000.

In 2016, the Trust has expanded its horizon with the launch of P. P. Savani University, as an initiative in higher education aligned with global standards of excellence. Through this immersive educational endeavor, the Governing body aims to introduce South Gujarat to a new era in higher education and create a talent pool of professionally sensitized industry-ready professionals. A world class 100 acre campus has been developed which embodies an infrastructure facilitating undergraduate, postgraduate, research, certificate and skill-development programmes.



MESSAGE FROM DIRECTOR

School of Sciences, PP Savani University, Surat impart education and addressing the biotechnological, microbiological and environmental challenges that our society faces. Among our new and continuing education and outreach initiatives are the flourishing Bachelor of Science Degree in Biotechnology, Microbiology, Chemistry and Environmental Science, for which we are now beginning to continuing their education at leading graduate school programs. School of Sciences provides an excellent platform to achieve precisely this objective by imparting multidisciplinary education.

School of Sciences, PP Savani University, Surat is envisaged as an autonomous teaching-cum-research centre physically located in the University campus. Thus, all teaching and research facilities at School of Sciences, PP Savani University, Surat should be available to all the students of our University. In the near future it is envisioned that School of Sciences, PP Savani University, Surat will become a role model for other Universities to follow and in the process help elevate the standard of higher education and research across the country.

Mr. Vallabhbai Savani
Director



MESSAGE FROM PROVOST

Science is the key to innovation and inventions. Science behind many tools and technologies, at times may be invisible, is having an impeccable impact on sustainability, quality of life, and healthy ecosystems.

School of Sciences, PP Savani University, Surat, India is one of the best universities in Basic and applied sciences in India. Our students feel at home here and, with the help of excellent faculty members, become outstanding leaders on campus and organizations. The preparation our students receive not only makes them leaders in their chosen fields, but also in society.

However, the hope of entering this School of Sciences is not limited to Gujarat state, but is extended to many who are interested in life sciences, chemical sciences, and environmental sciences. Of course, students along with delegates of different states are also welcomed. The education and research system are the major features of the School of Sciences and is currently offering undergraduate programs in Biotechnology, Microbiology, Environmental sciences and Chemistry.

There are many young, dynamic and talented faculties with years of experience. I am honored by the overwhelming support we receive from management. They are passionate about University mission, success and continued growth for the future.

Dr. Parag Sanghani
Provost



MESSAGE FROM RESEARCH HEAD

School of Sciences, PP Savani University, Surat, India is striving for excellence in teaching, research and service; enhancing diversity and fostering harmony among our alumni, faculty, staff and students.

Building partnerships with our alumni and friends in business, industry and government to

- Increase research funding,
- Provide futuristic research and learning facilities, and
- Establish professorships and fellowships,

We continue to build on our strengths for fostering multidisciplinary research across the campus and around the globe. We provide experiential learning to train problem solvers and build future science leaders. Our fundamental and applied research lays a foundation for future inventions, economic development, start-up companies, and address global challenges related to sustainability, health and security. We welcome students, staff and faculty from other states within India and from all other countries.

Dr. Piyush Desai
Research Head



MESSAGE FROM PRINCIPAL OF THE SCHOOL

The shape of country is defined by the higher education and the research activities adapted by it for the production of potential human resources, which may abruptly bring new approaches for the nation.

Welcome to the School of Science at P P Savani University. The Department of Science was established in 2016 with an aim to offer courses in emerging areas of Biology, Chemistry and Environment. Our department's mission is to train young brain in various fields of Basic and Applied sciences. This multidisciplinary approach will cross-link nearly all branches of knowledge.

At P P Savani University, the School of Science, offers a unique opportunity of learning various emerging disciplines of sciences. Our research oriented and liberal academic culture empowers our students with a profound understanding of both fundamental and applied sciences with a focus on modern tools including but not limited to, genetic engineering, microbiology, computational biology, chemistry and environmental sciences. Since its inception, the School has grown appreciably in various branches of Sciences offering B.Sc., M.Sc. and Ph.D programs in the fields of Biotechnology, Microbiology, Chemistry and Environmental Science.

Aims:

- To provide institute, legal financial and policy support.
- To facilitate networking among stakeholders at Regional, National and International level.
- To facilitate the infrastructure development and R & D activities.
- To create scientific awareness, sensitization, socio ethical acceptance and adoption to the potentials and application of biotechnology.

I conclude this Message from the table of Head of School by saying,

"Visionary for the achievement is, though, the prime component to lead better for an organization, once a stakeholder is in the key position, and it is not surely done until the person is with positive thought."

Dr. Hiren Patel (Ph.D)
I/C Principal



P P SAVANI
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PROGRAMMES OFFERED AT UNIVERSITY

- M.Sc. (H.) Biotechnology
- M.Sc. (H.) Microbiology
- B.Sc. (H.) Biotechnology
- B.Sc. (H.) Microbiology
- Integrated (Biotechnology, Microbiology)
- B.Sc. (H.) Environment Science
- B.Sc. (H.) Chemistry
- B.Sc. (H.) IT
- Bachelor of Physiotherapy
- Bachelor of Interior Design
- Bachelor of Architecture
- Bachelor of Nursing
- Bachelor of Engineering (Mechanical, IT, Computer, Textile, Civil, Chemical)
- Bachelor of Commerce



FACULTY PROFILES

Prof. Piyush Desai (PhD) is an Emeritus Professor in the School of Sciences. He is one of the leading Microbiologists of Gujarat and India. He has served as the Head and Professor at Department of Biosciences, Veer Narmada South Gujarat University, Surat. He has been chair and member of various state and national level scientific and academic committees. He is recipient of the prestigious award called '*National Biotechnology Fellowship award*' in 1990. He has published more than 50 research papers in journals of national and international repute. His areas of interest are in Textile Effluent and Agricultural Microbiology. He has mentored 20 PhD students, 6 MPhil students and 2 postdoctoral students during his career. He has 29 years of teaching experience in Microbiology at PG level. He wishes to create new milestones by training the best scientific minds in the state of Gujarat. His other interests include reading on diverse subjects, with spirituality as one of his favorites.



Dr. Hiren K. Patel (Ph.D.) presently working as I/C Principal, School of Sciences, P.P. Savani University and recipient of Gold Medal for "Best Innovative Research" holds a Ph.D. by Honorable Chancellor of Gujarat, Agricultural Minister of Gujarat & Deputy Director of ICAR, New Delhi and is a twice NET qualified scholar. He has selected as "Top 05 Young Scientist" by prestigious committee "The Gujarat Association for Agricultural Sciences". He is honored with "Best Ph.D. Research-2016" by All India of Human Rights, Liberties & social Justice.



Dr. Patel has also appointed as referee for European Molecular Biology Laboratory (EMBL) International Ph.D. Programme. Dr. Patel, an academician and researcher has guided several UG, PG and M. Phil Biotechnology students and have published several research papers in National and International reputed journals. His area of interest is in Plant/Agricultural Molecular Biology & biotechnology, Microbial Biotechnology, Environmental Biotechnology, Bioaugmentation and Enzyme Technology.



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Dr. Amit Gupta (PhD) is an Assistant Professor in the Biotechnology department of the School of Sciences of P.P Savani University. He has pursued his Doctoral in Molecular Biology and Biochemistry from Guru Nanak Dev University, Amritsar; Post Doctorate Fellow from University of Witwatersrand, Johannesburg, South Africa and National Taiwan University hospital, Taipei; Senior Research Associate



(Scientist Pool scheme), in IICT, CSIR Hyderabad and then joined as Senior Scientist in Vidya Pratishthan School of Biotechnology, Baramati. Dr. Gupta is a researcher, reviewer and editorial member of several journals; has more than 146 publications in international journals including 4 patents (1 European, 2 US and one Indian patent). He has been awarded DST young scientist award and several best research paper awards at times. His area of interest lies in Preclinical and clinical studies i.e. vaccine adjuvant development, anti-inflammatory, antimicrobial activity, immunomodulatory, disease model studies, protease isolation against specific protein antigen.

Dr. Anish Kumar Sharma (PhD) is an Assistant Professor in the Biotechnology department of the School of Sciences of P.P Savani University. Dr. Sharma has pursued his Ph.D. in major subject of Plant Molecular Biology and Biotechnology with minor subject Microbiology and qualified GATE Biotechnology in 2011 with AIR-151 and 99.01 percentile, ICAR-NET in 2013 (67%) and CSIR-NET examination in 2013 with AIR-33.



He has published research papers in National as well as International journals. He submitted 10 nucleotide DNA sequence in NCBI. He has attended many National & International conferences, workshops and trainings. His area of interest lies in Plant Biotechnology, Microbial Molecular Biology and Environmental Biotechnology.



Dr. Sangha Bijekar (PhD) is an Assistant Professor in the Biotechnology Department of the School of Sciences of P. P. Savani University. She has done her M.Sc. (Biotechnology) from Dr. D.Y.Patil University, Pune. She has received her Ph.D. in Molecular Biology from Bangalore University, Bangalore. Her doctoral research was on medicinal plants.



Dr Sangha, an academician and researcher has mentored several UG and PG's dissertation projects. She has published her research and reviews in many National and International Journals. She also used to be an active blogger. She has witnessed many National, International conferences and workshops. Her areas of interests in teaching and research are in Molecular Biology, Biochemistry and Genetic Engineering. She manages to find time to pursue her other interests as well. She is an accomplished Kathak and Bharatnatyam dancer and actively participates in cultural and social activities.

Dr. Mehul R. Khimani is an Assistant Professor at School of Sciences, P.P. Savani University, Surat. He has obtained his doctoral degree in polymer chemistry from Veer Narmad South Gujarat University, Gujarat; specialize in characterization self-assembly in solution using different techniques. He has worked as a JRF and SRF during his doctorate. He has pursued his Post Doctorate from Qingdao University of Science and Technology, P.R. China.



His research interest in the field of Surface and Colloidal Science. He has published 9 research articles in reputed International Journals with the collaboration of abroad and Indian professors/scientists. He has attended/presented his research work in several National/International conferences. He has visited National Nuclear Energy Agency of Indonesia (BATAN), Kawasan Puspiptek Serpong, Tangerang, Indonesia to attend workshop in 2014.



Ms. Dipali Kathiriya is an Assistant Professor in the Environmental Science department of School of Science of P.P. Savani University. She has completed her B.E (Environmental Engineer) from L.D. College of Engineering, Ahmedabad and M.E (Environmental Engineer) from The Maharaja Sayajirao University of Baroda. She is UGC NET 2017 qualified in Environment Science. Her areas of interest are teaching and research in bioremediation of industrial effluent. She has attended many national conferences and seminars in the field of Environment. She is an Environmentalist not only by profession but also by heart. Besides teaching the student about nature she also makes them aware about their responsibility towards conserving it.



She is an avid reader of both fictional and non fictional books.

“The proper use of science is not to conquer nature but to live in it.”—Barry Commoner

Dr. Bharat Solanki (PhD) is an Assistant Professor in the Biotechnology Department of the School of Sciences of P P Savani University. He has pursued Doctorate in Biochemistry from Saurashtra University, Rajkot in the field of Nano-Biotechnology and he has qualified ICAR-NET. He has published several research paper in peer-reviewed journals of National and International repute.



He is recipient of the Summer Research Fellowship Programme by Science Academies of India. He has attended several National and International Conferences, Workshops and Trainings. He has gained professional experiences in the field of Biochemistry by working at prestigious Institute like IISc, IIT- Delhi, University of Delhi, and University of Kashmir etc. He has also acted as resource person for the preparation of JNU and other M.Sc. level competitive entrance examination in the subject of Biotechnology sponsored by GSBTM. His area of Interest lies in Protein Engineering, Enzyme Technology, Nano-biotechnology and bioactive natural Products.



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Ms. Parini Surti is an assistant professor at Biotechnology department of School of Science, P. P Savani University. She has completed her M.Sc Biotechnology from Nirma University, Ahmedabad. She has qualified CSIR-NET, DBT-NET and GATE. She has 4 years of research experience in the field of biochemistry. She has served as CSIR Junior and Senior Research Fellow at Biochemistry Department, the M. S University of Baroda. She has



received training from IISER Bhopal. She has published research and review articles in international journals; attended several national and international conferences and workshops. Her research interest includes microbiology, microbial biochemistry and molecular biology.

Parini Surti is a trained Bharatnatyam dancer. She has completed her B. A in performing arts from Bruhad Gujarat Sangeet Samiti. She has worked as a professional choreographer and has donned other hats of educationist, RTE activist; standup comic and improv artist.

M.Sc. Biotechnology, M.Sc. Microbiology B.Sc.(H.) Biotechnology, B.Sc.(H.) Microbiology, Integrated (Biotechnology, Microbiology) B.Sc.(H.) Environment Science, B.Sc.(H.) Chemistry

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Dr. Vishal Singh Negi is an Assistant Professor in the Department of Biotechnology / Microbiology, School of Sciences at the PP Savani University. He is a recipient of the prestigious International Ford Foundation Fellowship awarded for pursuing Ph.D. in Life Sciences. He received his Ph.D. in Molecular Biosciences and Bioengineering from the University of Hawaii, USA. After his Ph.D., Dr. Negi worked as a postdoctoral researcher in one of the



leading mesothelioma research laboratories in the world (UH Cancer Center, USA). Before joining PPSU, Dr. Negi was working on epigenomics and centromere biochemistry at UH Manoa, USA. He has published his research in several high-impact factor international journals and presented his work in several international conferences as well. Dr. Negi has mentored several undergraduate and postgraduate students and has been actively serving as a reviewer in several international journals. His research interest lies in epigenomics, microbiome, biochemistry, and bioinformatics. Besides academic and research activities, Dr. Negi enjoys playing badminton, table tennis, and volleyball.

Dr. Archana Negi is an Assistant Professor in the Department of Biotechnology / Microbiology, School of Sciences at the PP Savani University. She obtained her Ph.D. in Molecular Biosciences and Bioengineering from the University of Hawaii, USA. Dr. Negi has worked in academics as well as in industry. She has worked in premier research institutions such as ICGEB, and MBBE UH Manoa, USA. She has published several research articles in national and



international journals and presented her research findings in several international conferences. Dr. Negi has served as a reviewer in several international journals and has also mentored several undergraduate and postgraduate students. She has also conducted several clinical research studies for leading pharmaceutical companies such as Pfizer, Novo Nordisk, Eli Lilly & Company, Sanofi, and Novartis. Besides research, she has also taught UG and PG students in national and international institutions. Her research interest lies in plant tissue culture and transformation, plant microbiome, molecular biology, and biochemistry.

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ACADEMIC RULES AND REGULATIONS

Violation of the rules relating to discipline in P.P. Savani University includes the following categories of conduct by students:

1. Damaging any University property or property of any teacher or administrative staff member including peon at our campus or outside.
2. Disruption of teaching/practical classes; class test/examination; administrative work, curricular/extra-curricular activities including residential life at the campus.
3. Disrespectful behaviour of students with any staff members including peons.
4. Ragging is not allowed; this is consider to be a grave violation of personal dignity of the victim.
5. Use of abusive language including slogans may act as an offence.
6. Participation in Strikes, Dharnas etc. may also act as an offence.
7. Furnishing false information to the University in any form.
8. Consumption of alcoholic drinks, or any other intoxicants in the University premises and also smoking in the University premises.
9. Any type of weapons (knives, lathis, iron chains, iron rods etc.) in the University premises may act as an offence.
10. Arousing communal, caste or regional feelings or creating disharmony among fellow students.
11. In university, pages tearing; destroying or stealing of books or any other documents related to any staff member
12. Unauthorized acquisition or use of any University furniture in hostel room or elsewhere.
13. Unauthorized occupation of hostel room.
14. Improper rendering of adjustments against advances drawn from the University.
15. Improper behaviour at the University premises or during study tours.
16. Prohibition of cell phones in the classrooms/examinations, and other academic activities.
17. Use of undue political and other influences on teachers and functionaries of the University for favours.

Aforementioned conducts are not allowed and violation of these rules will be considered as serious offence and treated accordingly.



FACULTY DETAILS

Sr. No.	Faculty Name	Contact Details	Abbreviation
1.	Dr. Hiren Patel	Mo. No.: 09512035616 Email Id: hiren.patel@ppsuni.ac.in	HP
2.	Dr. Anish Sharma	Mo.No.: 07434061063, 09418373278 Email Id: dranishsharma@ppsuni.ac.in	AS
3.	Dr. Piyush Desai	Mo.No.:09427785942 Email id: piyush.desai@ppsuni.ac.in	PD
4.	Dr. Amit Gupta	Mo. No.: 08308881506 Email.id: amit.gupta@ppsuni.ac.in	AG
5.	Dr. Sangha Bijekar	Mo.No.: 08087118509 Email id: sangha.bijekar@ppsuni.ac.in	SB
6.	Dr. Mehul Khimani	Mo.No.: 09909013191 Email.id: mehul.khimani@ppsuni.ac.in	MK
7.	Ms. Dipali Kathiriya	Mo.No.: 07405733017 Email Id: dipali.kathiriya@ppsuni.ac.in	DK
8.	Dr. Bharat Solanki	Mo.No.: 09725900396 Email Id: bharat.solanki@ppsuni.ac.in	BS
9.	Ms. Parini Surti	Mo.No.: 09033687881 Email Id: parini.surti@ppsuni.ac.in	PS
10.	Dr. Vishal Singh Negi	Mo.No.: 8800309459 Email Id: vishal.negi@ppsuni.ac.in	VN
11.	Dr. Archana Negi	Mo.No.: 6355460976 Email Id: archana.negi@ppsuni.ac.in	AN



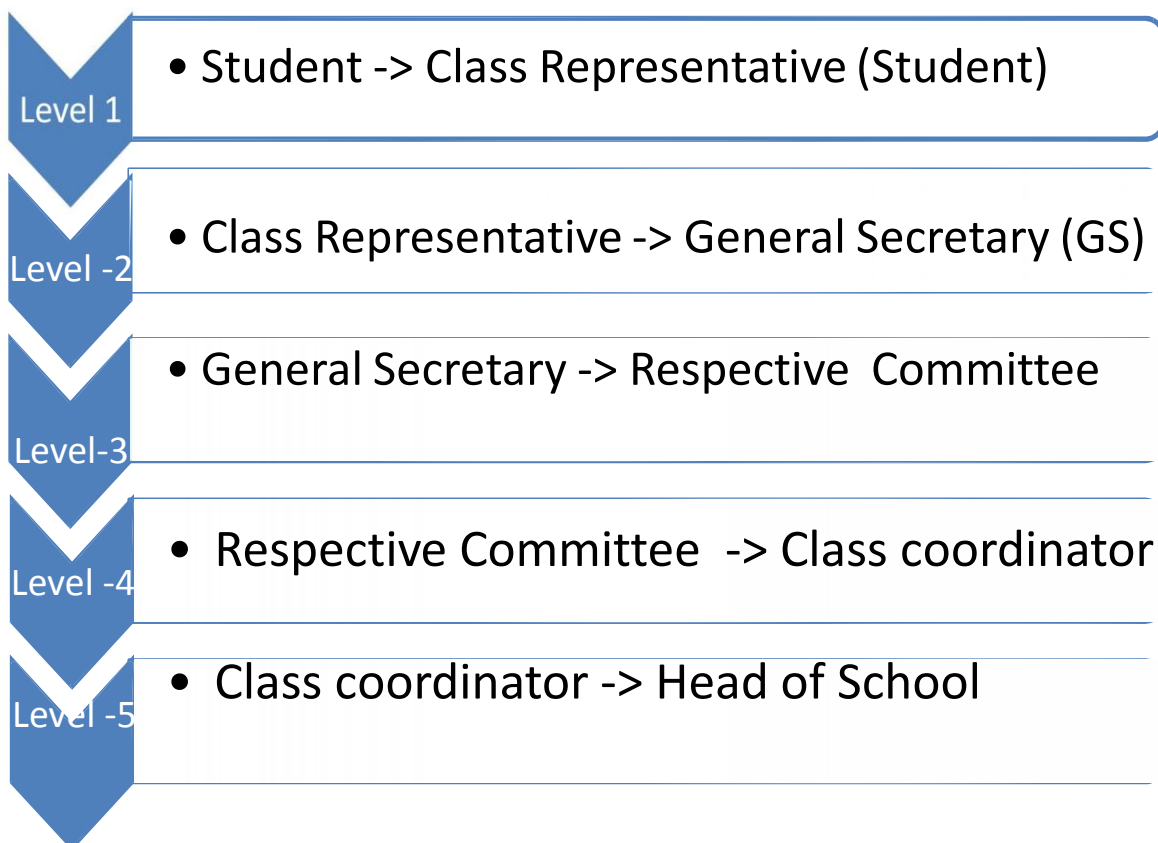
CO-ORDINATORS OF VARIOUS COMMITTEES (2018-19)

Sr. No.	Committees	Name of the member					
		Sem I BT+MB	Sem I ES+ Chem	Sem III BT	Sem III MB	Sem III ES	Sem V BT
1.	Class Coordinator	BS	MK	AS	AG	DK	SB
2.	Attendance and Discipline	AS & PS					
3.	Timetable & Academic year	HP, SB and DK					
4.	Cultural	SB and PS					
5.	Sports	BS and DK					
6.	Examination	AS, MK, and BS					
7.	Library Incharge	DK					
8.	Admission	HP, AG and MK					
9.	Visiting Faculty/Expert talk	HP, AG and SB					
10.	Purchasing	AG, MK, and BS					
11.	Placement/ Career Counseling	BS, MK, PS and SB					
12.	Anti-ragging	AG, HS, PS and DK					
13.	Women Cell	SB,DK and PS					
14.	Food	AG and AS					
15.	Transport	MK					
16.	ERP	SB, DK					



GRIEVANCE REPORTING SYSTEM

Student should strickly adhere the following system to report any Grievance.





ACADEMIC CALENDER 2018-19

Sr. No.	Event	Date
1.	Start of the Semester & Commencement of classes	20 th June 2018
2.	Internal theory Exam	24 th Sep – 13 th Oct 2018
3.	Diwali vacation	5 th Nov – 17 th Nov 2018
4.	End Semester External Exam	19 th Nov – 15 th Dec 2018
5.	Start of the Semester & Commencement of classes	17 th Dec 2018
6.	Internal Theory Exam	5 th March – 16 th March 2019
7.	End Semester External Theory Exam	15 th April – 18 th May 2019
8.	Summer Vacations	19 th May 2019 – 23 rd June 2019
9.	New Semester begins	24 th June 2019

Abstract:

June – Dec 2018

Month	Working days	Holidays	Total	Celebration	Holidays
June	10	1	11	21 st June International Yoga Day	
July	25	6	31		
August	24	7	31	15 th Aug Independence Day 31 st Aug Janmashtami	Bakar Eid, Rakshbandhan
September	22	8	30		Janmashtami, Ganesh Chaturthi and Moharam
October	25	6	31	17 th Oct Navratri	Mahatma Gandhi Jayanti, Dasher
November	3	14	17		Diwali Vacation
Total	109	42	151		

Dec 2018 – April 2019

Month	Working days	Holidays	Total	Celebration	Holidays
December	11	2	13	24 th Christmas	Christmas
January	24	7	31	12 th Jan Kite Flying 26 th Republic day 7 th or 21 st Jan International Conference	
February	23	5	28	15 & 16 Kalagoonj	
March	23	8	31		Holi, Mahashivratri
April	12	1	13		Good friday
Total	93	23	116		



P P SAVANI
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TEACHING
AND
EXAMINATION
SCHEME

Syllabus

Semester-1

P P Savani University
School of Sciences

Department of Biotechnology

Core Name: **Introduction to Biotechnology**

Prerequisite Course/s: **Nil**

Course Code	Teaching Scheme					Examination Scheme						
	Contact Hours				Credit	Theory		Practical		Tutorial		Total
	Theory	Practical	Tutorial	Total		CE	ESE	CE	ESE	CE	ESE	
SSBT1010	2	0	0	2	2	40	60	0	0	0	0	100
SSBT1020	2	0	0	2	2	40	60	0	0	0	0	100
SSBT1030	0	4	0	4	2	0	0	40	60	0	0	100

CE: Continuous Evaluation, ESE: End Semester Exam

Objective of the Course:

- To learn about basic concepts of Biotechnology, scope and applications
- To make students well conversant with current scenario of Biotechnology in India and across world

Course Content:

Course code:- SSBT1010			
Course Name:- Introduction to Biotechnology-I			
Units	Content	Hours (h)	Weightage (%)
1.	Plant-Introduction and outline classification of angiosperms, Gymnosperms	08	25
2.	Animal- Introduction and outline classification non-chordates (Prolifera to Echinodermates)	08	25
3.	Viruses- Structure and Classification	06	25
4.	Biotechnology: definitions, an interdisciplinary pursuit. Traditional and Modern Biotechnology Three central core components of Biotechnology Scope of Biotechnology,	08	25
Course code:- SSBT1020			
Course Name:- Introduction to Biotechnology-II			
1	Transgenics, Fundamentals of Plant Biotechnology: Transgenic plants Biotic and abiotic Resistant Plants developed, BT Cotton	08	25
2	Fundamentals of Animal Biotechnology: Transgenic animals and Livestock Improvements, Dolly sheep, Stem	08	25

	cell research		
3	Fundamentals of Microbial Biotechnology: Industrial important microbes and derived products.	08	25
4	Biotechnology Research in India. Biotechnology Institutions in India (Public and Private Sector Biotechnology in context of Developing World, Introduction to DBT	06	25

List of Practical/Tutorial:

Course code:- SSBT1030		
Course Name:- 1030-Biotechnology practical		
Sr No	Name of Practical/Tutorial	Hours(h)
1	Principle working & uses of following laboratory instruments: Microscope, Incubator, pH meter,	3
2	Principle working & uses of following laboratory instruments: Colony counter, Autoclave, Weighing balance, Laminar Air Flow (LAF) chamber	3
3	Principle working & uses of following laboratory instruments: Hot air oven, Inspissator and UV-VIS Spectrophotometer	3
3	Centrifugation including ultra-centrifugation	3
4	Preparation & sterilization of Glassware using Autoclave	3
5	Preparation & sterilization culture media	3
6	Methods of disposing the culture media, cultures and laboratory waste materials	3
7	A visit to nearby Industry	5
8	A visit to nearby Scientific laboratory	5

Reference/textbooks Book:

Title	Author/s	Publication
Elements of Biotechnology	P.K Gupta	Rastogi
Basic Biotechnology	Ratledge C & Kristiansen B	Cambridge University Press
Biotechnology: Expanding Horizon	B.D Singh	Kalyani publishers
Microbiology	Prescott	McGraw-Hill
Zoology for Degree Students	V K Agarwal	S Chand

Course Evaluation:

Theory:

- The Continuous Evaluation consists of maximum 40 Marks and include Internal exam, Seminar/class test/assignment submission and attendance & discipline.
- The Internal exam consists of 40 marks, which will be converted to 20 Marks.
- The Seminar/class test/assignment submission conducted will be of 10 Marks. The duration of each test shall be one hour.
- The attendance and discipline contain 10 marks during semester.
- End Semester Examination will consist of 60 Marks.

Practical/Tutorial:

- The Continuous Evaluation for practical exam consists of 40 Marks and include performance of practical (15 marks), Written practical (10 marks), Spotting (5 marks), Journal (5 marks) and Internal Viva (5 marks).

- End Semester Practical Exam consists of 60 marks covers practical performance (25 Marks), Written practical (15 marks), Spotting (5 marks), Journal (10 marks) and Internal Viva (5 marks).

Course Outcome:

1. Students will be prepared for upcoming hardcore courses of Biotechnology
2. Student will develop basic understanding of Biotechnology

P P Savani University
School of Sciences

Department of Microbiology

Core Name: **Microbiology**

Prerequisite Course/s: **Nil**

Teaching & Examination Scheme:

Course Code	Teaching Scheme					Examination Scheme						
	Contact Hours				Credit	Theory		Practical		Tutorial		Total
	Theory	Practical	Tutorial	Total		CE	ESE	CE	ESE	CE	ESE	
SSMB1010	2	0	0	2	2	40	60	0	0	0	0	100
SSMB1020	2	0	0	2	2	40	60	0	0	0	0	100
SSMB1030	0	4	0	4	2	0	0	40	60	0	0	100

CE: Continuous Evaluation, ESE: End Semester Exam

Objective of the Course:

- To introduce the students with the field of microbiology
- To make student aware about various types of microorganism and their general characteristics
- To prepare the student for general microbiology lab practices and handling of microbes in laboratory

Course Content:

Course code:- SSMB1010			
Course Name:- Introduction to Microbiology-I			
	Content	Hours (h)	Weightage (%)
1.	History and scope of Microbiology, Introduction to microorganisms, Discovery, Golden period of microbiology, Scope and future of microbiology	08	25
2.	Bacteria: General characteristics of Bacteria, archaea, cyanobacteria	06	25
3.	Fungi: General characteristics of fungi including habitat, nutritional requirements, fungal cell ultra- structure, thallus organization and aggregation	08	25
4.	Algae: General characteristics of algae including occurrence, thallus organization, algae cell ultra-structure	08	25
Course code:- SSMB1020			
Course Name:- Introduction to Microbiology-II			

1.	Microbial Classification, Systems of classification: Binomial Nomenclature, Whittaker's five kingdom and Carl Woese's three kingdom classification systems and their utility, Bacterial systematics	08	25
2.	Major cell Morphologies, Cell size and significance of smallness, Significance of surface to volume ratio, Lower limits of cell size.	06	25
3.	Bacterial cell surface appendages, Flagella, Pili, Fimbriae, Cell inclusions, Gas Vesicles, Endospores, Nucleoid	08	25
4.	Concept of Microscopy-resolution, simple and compound microscopy, various types of microscopy	08	25

List of Practical/Tutorial:

Course code:-SSMB1030		
Course Name:-1030- Microbiology Practical		
Sr No	Name of Practical/Tutorial	Hours (h)
1	Introduction to Microbiology Good Laboratory Practices and Biosafety	3
2	To study the principle and applications of important instruments: Biological safety cabinets, autoclave, incubator, BOD incubator	3
3	To study the principle and applications of important instruments: Hot air oven, light microscope, pH meter) used in the Microbiology laboratory	3
4	Sterilization of glassware, medium using autoclave and assessment for sterility	3
5	Sterilization of heat sensitive material by membrane filtration and assessment for sterility	3
6	Preparation of Nutrient broth and Nutrient agar medium	3
7	Demonstration of the presence of microflora in the environment by exposing nutrient agar plates to air	3
8	Microscopic observation of morphological characteristics of Protozoa/Yeast using compound microscope	3
9	Study of bacterial motility by hanging drop techniques	3
10	Preparation of culture media for microbes(bacteria, fungal, algal cultivation)	3

Text/Reference Book:

Title	Author/s	Publication
Microbiology	Prescott	McGraw-Hill
Microbiology	Peleczer	Tata McGraw-Hill
General Microbiology	Stanier RY, Ingraham JL, Wheelis ML, and Painter PR	5 th edition. McMillan (2005)
Experiments in Microbiology, Plant Pathology and Biotechnology	Aneja	New Age Publisher
Microbiology Introduction	Tortora Gerad	Benjamin Cumming

Course Evaluation:

Theory:

- The Continuous Evaluation consists of maximum 40 Marks and include Internal exam, Seminar/class test/assignment submission and attendance & discipline.
- The Internal exam consists of 40 marks, which will be converted to 20 Marks.
- The Seminar/class test/assignment submission conducted will be of 10 Marks. The duration of each test shall be one hour.
- The attendance and discipline contain 10 marks during semester.
- End Semester Examination will consist of 60 Marks.

Practical/Tutorial:

- The Continuous Evaluation for practical exam consists of 40 Marks and include performance of practical (15 marks), Written practical (10 marks), Spotting (5 marks), Journal (5 marks) and Internal Viva (5 marks).
- End Semester Practical Exam consists of 60 marks covers practical performance (25 Marks), Written practical (15 marks), Spotting (5 marks), Journal (10 marks) and Internal Viva (5 marks).

Course Outcome:

1. Student will be familiar to history, fundamental and terminology of microbiology
2. Student will gain knowledge of various class and general characteristics of microbes
3. Student will gain training on how to work with and handle microbes in laboratory

P PSavani University
School of Sciences

Department of Environment Science

Course Name: **Environment I & Chemistry I**

Prerequisite Course/s: **Nil**

Teaching & Examination Scheme:

Course Code	Teaching Scheme					Examination Scheme						
	Contact Hours				Credit	Theory		Practical		Tutorial		Total
	Theory	Practical	Tutorial	Total		CE	ESE	CE	ESE	CE	ESE	
SSES1010	2	0	0	2	2	40	60	0	0	0	0	100
SSES1020	2	0	0	2	2	40	60	0	0	0	0	100
SSES1030	0	4	0	4	2	0	0	40	60	0	0	100

CE: Continuous Evaluation, ESE: End Semester Exam

Objective of the Course:

- To present sound knowledge of chemistry fundamentals, enriching students to understand the role of Environment & Chemistry in the field of science.
- To inculcate habit of scientific reasoning to do the task rationally.

Course Content:

Course code:- SSES1010			
Course Name:- Introduction to Environment Science-I			
Units	Content	Hours(h)	Weightage(%)
1.	Multidisciplinary nature of environmental studies a) Definition, scope and importance b) Need for public awareness.	06	20
2.	Natural Resources: Renewable and non-renewable resources: Natural resources and associated problems. Forest resources; Water resources; Mineral resources; Food resources; Energy resources; Land resources	08	25
3.	Ecosystems a) Concept of an ecosystem. b) Structure and function of an ecosystem. c) Producers, consumers and decomposers. d) Energy flow in the ecosystem. e) Ecological succession. f) Food chains, food webs and ecological pyramids	08	30
4.	Biodiversity and its conservation Introduction – Definition: genetic, species and ecosystem diversity. Value of biodiversity : consumptive use, productive use, social, ethical, aesthetic and option values. Biodiversity at global, National and local levels. a) Indian Biodiversity & its importance (Hot Spots)	08	25

	<p>b) Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts.</p> <p>c) Endangered and endemic species of India</p> <p>d) Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.</p>		
Course code:- SSES1020			
Course Name:- Chemistry I			
1	<p>Structure of Atom: Atom, sub-atomic particles, Rutherford's atomic model, Mosley's determination of atomic number, Electromagnetic spectrum, Continuous spectrum, Atomic spectra, Atomic spectrum of hydrogen, Quantum theory of radiation, Explanation to Photoelectric effect, Compton effect, Bohr's model of atom, Zeeman effect.</p>	6	25
2	<p>Chemical Bonding and Structure of Molecules: General terms: Chemical bond, valence, valence electrons, Bonding and Non bonding electrons, Lewis symbols, Octet rule. Ionic bond: Definition, Condition for formation of ionic bond, Factors governing formation of ionic bond, Characteristics of ionic compounds. Covalent bond: Definition, conditions for covalent bond formation, examples, General characteristics of covalent compounds, valence bond approach, Concept of hybridization, Hybridization and shape of molecules, Limitations of Valence bond theory, VSEPR theory. Hydrogen bonding: Definition, conditions for H-bond formation, examples, Types of H-bonds, Characteristics of H-bonded compounds. Metallic bond: Definition, The Electron sea model</p>	8	25
3	<p>Acid and Bases: Basic properties of acids and bases, Arrhenius concept, Lowry Bronsted Concept, Lewis concept of acids and bases, Derive equation for relative strength of strong acids and bases, Calculate the relative strength of weak acids and bases, pH of solutions, measurement of pH, pH scale, common ion effect, Buffer solutions, Discuss how the addition of a small amount of acids or bases not affects the pH of buffer solutions, derivation of Henderson equation and its applications; buffer capacity, buffer range, buffer action and applications of buffers in analytical chemistry and biochemical processes in the human body. Numerical Problems.</p>	8	25
4	<p>Colloids Lyophilic and lyophobic sols, Characteristics of lyophilic and lyophobic sols, preparation of sols, Purification of sols, Dialysis, Properties of sols, stability of sols, coagulation or flocculation of colloids, gold number, zeta potential, application of colloids.</p>	8	25

List of Practical/Tutorial:

Course code:- SSES1030		
Course Name:- 1030-Environment & Chemistry Practical-I		
Sr No	Name of Practical/Tutorial	Hours

1	Water & waste water quality assessment experiment.	6
2.	Analysis of salts/ions present in hard & soft water	6
3.	Visit to Local Polluted Site -Observations and Remedial Measures	6
4.	Visit to In situ or Ex situ Conservation Centre/ Social Service Organization/ Environmental Education Centre	12
Chemistry Practical's		
1.	Introduction to chemistry laboratory – Equipment, common laboratory glasswares and their uses. General awareness on handling of chemicals and waste disposal in laboratory, fire hazards, eye protection, contact and ingestion hazard.	6
2.	Prepare 0.1N NaOH solution and standardize it by given oxalic acid solution.	6
3.	Determination of dissociation constant of strong acid by pH metric method	6
4.	Surface tension measurements of different solvents by stalagmometer	6
5.	Determine the precipitation values for arseniousulphide sol	6

Reference/textbooks Book:

Title	Author/s	Publication
The Biodiversity of India,	Bharucha Erach,	Mapin Publishing Pvt. Ltd., Ahmedabad – 380 013, India
Environmental Biology,	Agarwal, K.C.	Nidi Publ. Ltd. Bikaner.
Fundamentals of Ecology.	Odum, E.P.	W.B. Saunders Co. USA, 574p
Essentials of Physical Chemistry	A.Bahl, B.S. Bahl and G.D. Tuli	S. Chand Publishing

Title	Author/s	Publication
Textbook of Engineering Chemistry (4 th Edition)	R. Gopalan, D. Venkappaya, S. Nagarajan	Vikas Publishing house Ltd.
Concise Inorganic Chemistry	J.D. Lee	Wiley India
Engineering Chemistry (16 th Edition)	P.C. Jain and Monika Jain	Dhanpat Rai publishing company
Essentials of Physical Chemistry	A.Bahl, B.S. Bahl and G.D. Tuli	S. Chand Publishing

Course Evaluation:

Theory:

- The Continuous Evaluation consists of maximum 40 Marks and include Internal exam, Seminar/class test/assignment submission and attendance & discipline.
- The Internal exam consists of 40 marks, which will be converted to 20 Marks.
- The Seminar/class test/assignment submission conducted will be of 10 Marks. The duration of each test shall be one hour.
- The attendance and discipline contain 10 marks during semester.
- End Semester Examination will consist of 60 Marks.

Practical/Tutorial:

- The Continuous Evaluation for practical exam consists of 40 Marks and include performance of practical (15 marks), Written practical (10 marks), Spotting (5 marks), Journal (5 marks) and Internal Viva (5 marks).
- End Semester Practical Exam consists of 60 marks covers practical performance (25 Marks), Written practical (15 marks), Spotting (5 marks), Journal (10 marks) and Internal Viva (5 marks).

Course Outcome:

After successful completion of the course, students will be...

1. Able to understand the relevance of fundamental and applications of chemical sciences and chemistry in the field of biotechnology.
2. Able to apply the knowledge of colloidal, acids, and bases chemistry for different biological systems.

P P Savani University
School of Science

Centre for Skill Enhancement & Professional Development

Course Code:SEPD1010

Course Name: Academic English and Technical Writing

Prerequisite Course/s:

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
02	02	00	3	40	60	25	25	--	--	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objectives of the Course:

To help learners to

- Improve speaking, listening, reading and writing skills in an academic environment
- Write academic texts effectively, as well as improve grammar and vocabulary
- Express ideas clearly and accurately with accurate writing
- Form and practice strategies for reading in the academic contexts quickly and effectively
- Gain confidence in speaking English in an academic context and also analyze and improve pronunciation

Course Content:

Section I - Theory			
Module	Content	Hours	Weightage
1.	Introduction to Academic English <ul style="list-style-type: none"> • General English Vs Academic English • Academic Vocabulary • Grammar for Academic Purposes 	04	10 %
2.	Academic Reading <ul style="list-style-type: none"> • Introduction to Reading • Types of Reading • Techniques of Reading 	06	20 %
3.	Academic Listening <ul style="list-style-type: none"> • Introduction to Listening • Types of Listening • Techniques of Listening 	06	20 %
4.	Academic Speaking <ul style="list-style-type: none"> • Introduction to Speech and Its importance • Phonetics and Transcription to effective pronunciation • Speaking in various contexts 	06	20 %
5.	Technical Writing <ul style="list-style-type: none"> • Understanding clauses and Syntax • Cohesion and Coherence/ Building Paragraphs • Flow/ structure of Writing • Punctuations • Application/ Letter Writing 	08	30 %

	<ul style="list-style-type: none"> Review/ Report Writing E-mail etiquettes 		
Section II – Practical			
Module	Content	Hours	Weightage
1.	Introduction to Academic English <ul style="list-style-type: none"> Ice Breakers Role Plays Grammar and Vocabulary Activities 	04	15 %
2.	Academic Reading (Computer Assisted) <ul style="list-style-type: none"> Reading for summarizing/ paraphrasing Critical Reading Reading for presentation Utilizing web resources 	04	15 %
3.	Academic Listening (Computer Assisted) <ul style="list-style-type: none"> Listening for Note Taking/ Note making Critical Listening Comprehensive Listening 	06	20 %
4.	Academic Speaking <ul style="list-style-type: none"> Speaking and pronunciation activities Extempore and Impromptu speech/ presentation 	08	25 %
5.	Technical Writing (Computer Assisted) <ul style="list-style-type: none"> Letter/ Application Book Review/ Movie Review Email Analytical Writing (Paragraph) Review Writing Article Writing 	08	25 %

List of Practical/Tutorial:

Sr. No	Name of Practical	Hours
1.	Introduction to Academic English – Ice Breaker	02
2.	Introduction to Academic English – Vocabulary Games and Grammar Activity	02
3.	Reading for Summarizing and Paraphrasing	02
4.	Reading for review writing/ Skimming and Scanning Web Resources	02
5.	Comprehensive Listening: Note Taking and Note Making	02
6.	Comprehensive Listening: Summarizing and Paraphrasing	02
7.	Critical Listening: An analysis	02
8.	Speech for Pronunciation	02
9.	Speech for Presentation	02
10.	Speech for Fluency	02
11.	Conversational Skills	02
12.	Academic Writing: Paragraph Building	02
13.	Academic Writing: Critical Review Writing	02
14.	Leave Application/ Request Letter/Business Letter	02
15.	Notice/Memo/Agenda/ Minutes	02

Text Book (s)

Title	Author/s	Publication
Practical Techniques to Develop Communication Skills	Parul Popat&KaushalKotadia	PothiPrakashan, 2015

Reference Books:

Title	Author/s	Publication
English for Academic Purposes: A Guide and Resource Book for Teachers	R. R. Jordan	Cambridge University Press, 1997
English for Academic Purposes: An Advanced Resource Book	Ken Hyland	Routledge, 2006
Engineers' Guide to Technical Writing	Kenneth G. Budinski	ASM International, 2001
Communication Skills	Parul Popat&KaushalKotadia	Pearson, 2015

Web Material Links:

- <https://msu.edu/course/be/485/bewritingguideV2.0.pdf>
- <https://www.khanacademy.org>
- <http://www.kantakji.com/media/6494/t121.pdf>

Course Evaluation:**Theory:**

- Continuous Evaluation Consist of Two Test Each of 15 Marks and 1 Hour of duration.
- Submission of assignment which consists of 5 Questions to be answered under each module and it carries 10 Marks of Evaluation.
- End Semester Examination will consist of 60 Marks Exam.

Practical/Tutorial:

- Continuous Evaluation Consist of Performance of Practical/Tutorial which should be evaluated out of 10 for each practical/Tutorial in the next turn and average of the same will be converted to 15 Marks.
- Internal Viva component of 10 Marks.
- Practical performance/quiz/drawing/test of 15 Marks during End Semester Exam.
- Viva/Oral performance of 10 Marks during End Semester Exam.

Course Outcomes:

Students will be able to

1. Effectively use LSRW skills in English in an academic environment.
2. Write Academic English effectively with improved grammar and vocabulary.
3. Practice strategies for comprehensive reading in English.
4. Speak English in an academic context fluently and efficiently.

Semester-2

P P Savani University
School of Sciences

Department of Biotechnology

Core Name: **Cell Biology I & II**

Prerequisite Course/s:

Teaching & Examination Scheme:

Course Code	Teaching Scheme					Examination Scheme						
	Contact Hours				Credit	Theory		Practical		Tutorial		Total
	Theory	Practical	Tutorial	Total		CE	ESE	CE	ESE	CE	ESE	
SSBT1040	2	0	0	2	2	40	60	0	0	0	0	100
SSBT1050	2	0	0	2	2	40	60	0	0	0	0	100
SSBT1060	0	4	0	4	2	0	0	40	60	0	0	100

CE: Continuous Evaluation, ESE: End Semester Exam

Objective of the Course:

- To learn about cell and its organelles
- To develop basic understanding for cellular structures and there functions
- To make students understand process about cell division and cancer

Course Content:

Course code:- SSBT1040			
Course Name:- Cell Biology-I			
Units	Content	Hours(h)	Weightage (%)
1.	Discovery of cells, Basic properties of cells, Fundamental classes of cells: Prokaryotic(Bacterial cell, Archaeal cell), Eukaryotic cells (Plant and Animal), Viruses	08	25
2.	Structure and various models of biological membranes, Organization and Fluid Mosaic Model, membrane as a dynamic entity, cell recognition and membrane transport.	06	25
3.	Structure, composition and functions of: a) Membrane Vacuolar system b) Endoplasmic reticulum c) Golgi complex	08	25
4.	Structure, composition and functions of: a) Lysosomes b) Ribosomes c) Mitochondria d) Chloroplasts e) Nucleus	08	25

Course code:- SSBT1050			
Course Name:- Cell Biology-II			
1	The Cell cycle and its Regulation via various Checkpoints	08	25
2	Mitosis: cell division of somatic cell, Various Phases (Prophase, Prometaphase, Metaphase, Anaphase, Telophase), Forces required for Mitotic Movements, Cytokinesis	08	25
3	Meiosis: cell division of gametic cell, Various Phases in Meiosis I and Meiosis II, Genetic recombination during Meiosis	08	25
4	Oncology: study of Cancer, types and molecular basis of cancer, Programmed cell death(PCD)	06	25

List of Practical/Tutorial:

Course code:- SSBT1060		
Course Name:- 1060-cell Biology practical		
Sr No	Name of Practical/Tutorial	Hours(h)
1.	Study of structure of Prokaryotic and Eukaryotic cells	3
2.	To study osmosis	3
3.	Demonstration of dialysis	3
4.	To study of plasmolysis and de-plasmolysis	6
5.	To study various Cell division stages in onion root tip	3
6.	Estimation of reducing sugar by Cole's method	3
7.	Estimation of reducing sugar by Folin-lowry's method	3
8.	Quantitative estimation of amino-acids by Ninhydrin method	3
9.	Microscopic observation of Drosophila compound eyes	3

Reference/textbooks Book:

Title	Author/s	Publication
Cell and Molecular Biology: Concepts and Experiments.	Karp, G. 2010.	6 th Edition. John Wiley & Sons. Inc.
Cell and Molecular Biology.	De Robertis, E.D.P. and De Robertis, E.M.F. 2006.	8 th edition. Lippincott Williams and Wilkins, Philadelphia
Cell Biology	Bhatia KN	Trueman
The Cell: A Molecular Approach	Geoffrey M. Cooper, Robert E. Hausman	Sinauer

Course Evaluation:

Theory:

- The Continuous Evaluation consists of maximum 40 Marks and include Internal exam, Seminar/class test/assignment submission and attendance & discipline.
- The Internal exam consists of 40 marks, which will be converted to 20 Marks.
- The Seminar/class test/assignment submission conducted will be of 10 Marks. The duration of each test shall be one hour.
- The attendance and discipline contain 10 marks during semester.
- End Semester Examination will consist of 60 Marks.

Practical/Tutorial:

- The Continuous Evaluation for practical exam consists of 40 Marks and include performance of practical (15 marks), Written practical (10 marks), Spotting (5 marks), Journal (5 marks) and Internal Viva (5 marks).
- End Semester Practical Exam consists of 60 marks covers practical performance (25 Marks), Written practical (15 marks), Spotting (5 marks), Journal (10 marks) and Internal Viva (5 marks).

Course Outcome:

1. Students will gain knowledge about cell, its structure, parts, and organelles in different living organisms.
2. They will get well conversant with various stages of mitosis and meiosis as well as know about cancer, its causes, remedies, control and genetics.
3. Understanding of cell cycle and its control will help student in better understanding of cancer and its treatment

P PSavani University
School of Sciences

Department of Microbiology

Core Name: **Microbiology**

Prerequisite Course/s: **Nil**

Teaching & Examination Scheme:

Course Code	Teaching Scheme					Examination Scheme						
	Contact Hours				Credit	Theory		Practical		Tutorial		Total
	Theory	Practical	Tutorial	Total		CE	ESE	CE	ESE	CE	ESE	
SSMB1040	2	0	0	2	2	40	60	0	0	0	0	100
SSMB1050	2	0	0	2	2	40	60	0	0	0	0	100
SSMB1060	0	4	0	4	2	0	0	40	60	0	0	100

CE: Continuous Evaluation, ESE: End Semester Exam

Objective of the Course:

- To introduce student to bacterial cell structure and taxonomy
- To learn the bacterial growth kinetics, the most important aspects
- To introduce student with various biological macromolecules
- To develop the skill of isolating and culturing bacteria using various traditional bacteriology methods

Course Content:

Course code:- SSMB1040			
Course Name:- Fundamentals of Bacteriology-I			
UNIT	Content	Hours(h)	Weightage(%)
1.	Nutritional Requirement of Bacteria, Needs of Carbon, Hydrogen, oxygen, Electrons, Nitrogen, Phosphorus, Sulfur	06	25
2.	Types of microbes based on nutritional requirement, Growth factors	08	25
3	Bacteriological techniques, Pure culture isolation: Streaking plate, serial dilution and plating methods; cultivation, maintenance and preservation/stocking of pure cultures	08	25
4.	Concept and Types of Culture media: Chemical, Physical & Biological	08	25
Course code:- SSMB1050			
Course Name:- Fundamental of Bacteriology-II			
1	Bacterial Cell cycle, Growth curve, Techniques for Bacterial Growth measurement	08	25
2	Batch and continuous culture of micro-organisms (Chemo stat and Turbidostat), Microbial Growth in natural environments,	08	25

3	Influence of Environment on Microbial growth(Solutes and water activity, pH, Temperature, Oxygen concentration, Pressure, Radiation)	08	25
4	Chemotaxis, Structures responsible for motility in bacteria, Types of motility	06	25

List of Practical/Tutorial:

Course code:- SSMB1060		
Course Name:- 1060-Bacteriology practical		
Sr No	Name of Practical/Tutorial	Hours (h)
1	Preparation of different media: Synthetic media& Complex media	3
2	Cultivation of bacteria using Broth culture	3
3	Cultivation of bacteria using Slant-culture	3
4	Cultivation of bacteria using Stab-culture	3
5	Enumeration of CFU by spread plate method	3
6	Enumeration of CFU by pour plate method	3
7	Isolation of pure cultures of bacteria	3
8	Gram Staining: principle & procedure	3
9	Preservation of bacterial cultures by various techniques	3
10	Motility by hanging drop method	3

Text/Reference Book:

Title	Author/s	Publication
Microbiology	Prescott	McGraw-Hill
Microbiology	Pelczar	Tata McGraw-Hill
Experimental Microbiology	Rakesh Patel	AdityaPrakashan
Experiments in Microbiology, Plant Pathology and Biotechnology	Aneja	New Age Publisher

Course Evaluation:

Theory:

- The Continuous Evaluation consists of maximum 40 Marks and include Internal exam, Seminar/class test/assignment submission and attendance & discipline.
- The Internal exam consists of 40 marks, which will be converted to 20 Marks.
- The Seminar/class test/assignment submission conducted will be of 10 Marks. The duration of each test shall be one hour.
- The attendance and discipline contain 10 marks during semester.
- End Semester Examination will consist of 60 Marks.

Practical/Tutorial:

- The Continuous Evaluation for practical exam consists of 40 Marks and include performance of practical (15 marks), Written practical (10 marks), Spotting (5 marks), Journal (5 marks) and Internal Viva (5 marks).
- End Semester Practical Exam consists of 60 marks covers practical performance (25 Marks), Written practical (15 marks), Spotting (5 marks), Journal (10 marks) and Internal Viva (5 marks).

Course Outcome:

- Students acquire the basic knowledge about bacterial cell structure, microscopy, taxonomy and bacterial growth kinetics
- The exposure of student to several important culturing and isolation method in bacteriology

P PSavani University
School of Sciences

Department of Environmental science

Core Name: **Environment –II&Chemistry-II**

Prerequisite Course/s: **Nil**

Teaching & Examination Scheme:

Course Code	Teaching Scheme					Examination Scheme						
	Contact Hours				Credit	Theory		Practical		Tutorial		Total
	Theory	Practical	Tutorial	Total		CE	ESE	CE	ESE	CE	ESE	
SSES1040	2	0	0	2	2	40	60	0	0	0	0	100
SSES1050	2	0	0	2	2	40	60	0	0	0	0	100
SSES1060	0	4	0	4	2	0	0	40	60	0	0	100

CE: Continuous Evaluation, ESE: End Semester Exam

Objective of the Course:

- To give a comprehensive insight into basics of Environment –II & Chemistry-II.
- Imparting basic knowledge about biomolecules, hydrocarbons and fundamentals of reaction mechanism.

Course Content:

Course code:- SSES1040			
Course Name:- Introduction to Environment Science-II			
Units	Content	Hours(h)	Weightage (%)
1.	Environmental Pollution: Definition • Cause, effects and control measures of :- a) Air pollution b) Water pollution c) Soil pollution d) Marine pollution e) Noise pollution f) Thermal pollution g) Nuclear hazards	08	25
2.	Social Issues and the Environment a) From Unsustainable to Sustainable development b) Urban problems related to energy c) Water conservation, rain water harvesting, watershed management d) Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust.	08	25

3.	a) Environment Protection Act. b) Air (Prevention and Control of Pollution) Act. c) Water (Prevention and control of Pollution) Act d) Wildlife Protection Act e) Forest Conservation Act	06	30
4.	Human Population a) Population growth, variation among nations. b) Population explosion – Family Welfare Programme. c) Impact of Climate change on Environment and human health.	08	20
Course code:- SSES1050			
Course Name:- Chemistry-II			
1	Hydrocarbons Definitions (Bond distances, Bond angles, Torsion angle, Isomers) (i) Alkanes: Nomenclature, sources, methods of formation, Physical properties and chemical reactions. (iii) Alkenes: Nomenclature, method of preparation, Physical properties, Reactions of alkenes (iv) Dienes: nomenclature, classification of dienes methods of formation of Butadiene chemical reactions 1,2 and 1,4 additions. (v) Alkynes: nomenclature methods of formation, chemical reactions, electrophilic and nucleophilic addition reactions of acetylene.	8	27
2	Fundamentals of reaction mechanism Introduction, Homolytic fission, Heterolytic fission, Classification of reactions, Inductive effect, Electromeric effect, Resonance and mesomeric effect, Hyperconjugation and their applications, Effect of hybridization, Dipole moment, types of arrow, Electrophiles and Nucleophiles, Dipole moment, types of arrow, Electrophiles and Nucleophiles, Leaving groups, Basic idea about Carbocations, Carbanions, Free radicals and Carbenes and their stability, Types of addition reaction, Types of substitution reaction, Types of elimination reaction, mechanism of nucleophilic substitution reaction, mechanism of elimination reaction, steric hindrance, Hydride and alkyl shift, aldol condensation, Beckmann rearrangement.	8	26
3	Chemical Kinetics Introduction, reaction rate, units of rate, rate laws, order of a reaction, molecularity of a reaction, Molecularity of a complex reaction, Differences between order and molecularity, Psuedo order reactions, zero order reaction, Derivation rate constant equation for zero order reaction, First order reaction, Derivation rate constant equation for first order reaction, Units of rate constant, Half -life of a reaction, Calculation of half-life of a first order reaction	8	27
4	Thermodynamics Introduction, scope and limitation of thermodynamics, System, boundary, surroundings, homogeneous and heterogeneous systems, Types of thermodynamic systems, Intensive and extensive properties, state of system, Equilibrium and non-equilibrium states, Process, Types of processes: Isobaric, Isochoric, Isothermal, adiabatic, reversible and irreversible process, Heat and work, pressure-volume work, Internal energy, Sign conversations and units, First law of	6	20

	thermodynamics, enthalpy of system, Relation between ΔH and ΔE , Heat capacity, Specific and molar heat capacities, Concept of entropy, Entropy and its unit.		
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List of Practical/Tutorial:

Course code:- SSES1060		
Course Name:- 1030-Environment & Chemistry Practical-II		
Sr No	Name of Practical/Tutorial	Hours
1	Field work Visit to a local area to document environmental assets i.e. river/forest/grassland/hill/mountain	5
2.	Visit to a local polluted site-Urban/Rural/Industrial/Agricultural	5
3.	Study of common plants, insects, birds.	5
4	Study of simple ecosystems-pond, river, hill slopes, etc.	5
5	Estimation of Dissolved Oxygen in Water sample	10
Chemistry Practical's		
1	To determine the viscosity of a given solvents	6
2	Identify and determine melting point, boiling point, and solubility of various organic compounds.	6
3	Determination of concentration of unknown solution spectrophotometrically	12
4	To study the monomolecular reaction in the hydrolysis of methyl acetate in 0.5 N HCl at different initial concentrations.	6

Reference/textbooks Book:

Title	Author/s	Publication
The Biodiversity of India,	Bharucha Erach,	Mapin Publishing Pvt. Ltd., Ahmedabad – 380 013, India
Environmental Biology,	Agarwal, K.C.	Nidi Publ. Ltd. Bikaner.
Fundamentals of Ecology.	Odum, E.P.	W.B. Saunders Co. USA, 574p

Chemistry Reference/textbooks Book:

Title	Author/s	Publication
Molecular biology of cells	David Baltimore, Harvey Lodish	S. Chand Publishing
A textbook of Organic Chemistry	Arun Bahl and B S Bahl	S. Chand
March's Advanced Organic Chemistry; Reactions, Mechanisms and structure	Michael Smith and Jerry March	Wiley Publications
Essentials of Physical Chemistry	A. Bahl, B. S. Bahl and G. D. Tuli	S. Chand Publishing
Atkins' Physical Chemistry 10 th Edition	Peter Atkins and Julio de Paula	Oxford University Press

Course Evaluation:

Theory:

- The Continuous Evaluation consists of maximum 40 Marks and include Internal exam, Seminar/class test/assignment submission and attendance & discipline.
- The Internal exam consists of 40 marks, which will be converted to 20 Marks.

- The Seminar/class test/assignment submission conducted will be of 10 Marks. The duration of each test shall be one hour.
- The attendance and discipline contain 10 marks during semester.
- End Semester Examination will consist of 60 Marks.

Practical/Tutorial:

- The Continuous Evaluation for practical exam consists of 40 Marks and include performance of practical (15 marks), Written practical (10 marks), Spotting (5 marks), Journal (5 marks) and Internal Viva (5 marks).
- End Semester Practical Exam consists of 60 marks covers practical performance (25 Marks), Written practical (15 marks), Spotting (5 marks), Journal (10 marks) and Internal Viva (5 marks).

Course Outcome:

After successful completion of the course, students will be...

1. Able to obtain fundamental knowledge of organic chemistry which can be useful in the field of biotechnology.
2. Able to apply the knowledge of thermodynamics, chemical kinetics and applied in different chemical systems.

P P Savani University
School of Science

Centre for Skill Enhancement & Professional Development

Course Code:SEPD1020

Course Name:Communication Skills

Prerequisite Course/s:

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
02	02	00	3	40	60	25	25	--	--	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objectives of the Course:

To help learners to

- Hone basic communication skills of the students by exposing them to the key communication techniques, and thereby
- Improve comprehension and expressional skills of the students required for personal, Social, academic and professional environment
- Sharpen Communication Skills of the students with reference to Organizational Structure,
- Expose them to the modern modes of communication,
- Show the students importance of team work and give practice in Group Communication with reference to Group Dynamics,

Course Content:

Section I- Theory			
Module	Content	Hours	Weightage
1.	Introduction to Communication Skills <ul style="list-style-type: none"> • Concept and Process of Communication • Types of Communication • Principles of Effective Communication • Barriers to Communication 	06	20 %
2.	Interpersonal Organizational Communication <ul style="list-style-type: none"> • Styles of Communication • Flows of Communication • Essentials of Organizational Communication • Kinesics, Proxemics and Chronemics • Cross cultural Communication 	06	20 %
3.	Team/ Group Dynamics and Leadership <ul style="list-style-type: none"> • Introduction to Group Work and Group Dynamics • Types of Groups and Essentials of Group Work and networking • Concept and Types of Leadership • Traits of an Effective Leader 	06	20 %
4.	Presentation Skills <ul style="list-style-type: none"> • Introduction to presentation and its importance • Modes, means and purposes of presentation • Defining purpose, analyzing audience and organizing the contents 	06	20 %

	<ul style="list-style-type: none"> • Visual aids and nuances of delivery • Body language and effective presentation 		
5.	Communication and Contemporary World <ul style="list-style-type: none"> • Introduction to Contemporary personal, social and professional set ups • Modern Day Communication tools and their efficacy • Effective usage of Modern Day Communication tools for personal and professional growth 	06	20 %
Section II – Practical			
Module	Content	Hours	Weightage
1.	Introduction to Communication Skills <ul style="list-style-type: none"> • Role Plays • Communication Games and Activities 	06	20 %
2.	Interpersonal Organizational Communication <ul style="list-style-type: none"> • Group Tasks • Flip Classroom Activity • Role plays • Other Relevant Activities and Games 	06	20 %
3.	Team/ Group Dynamics and Leadership <ul style="list-style-type: none"> • Group Activities • Case Studies • Team Building Games 	06	20 %
4.	Presentation Skills <ul style="list-style-type: none"> • Individual Presentation practicing various modes • Reading and Preparing for Presentation • Self-Peer-teacher assessment of the Presentation 	06	20 %
5.	Communication and Contemporary World <ul style="list-style-type: none"> • Exploring various Communication tools • Assigning Group Individual Tasks 	06	20 %

List of Practical:

Sr. No	Name of Practical	Hours
1.	Introduction to Communication: An Ice Breaker	02
2.	Verbal/ Non Verbal Communication Pros and Cons	02
3.	Principles of Communication	02
4.	Interpersonal Communication	02
5.	Organizational Communication	02
6.	Assertive Vs Aggressive Communication	02
7.	Group Dynamics: A Decision Making Activity	02
8.	Group Dynamics Working together to achieve organizational vision	02
9.	Leadership: Holding a diverse Group Together	02
10.	Presentation Skills; Video Session	02
11.	Presentations by the Students: Self-Peer-teacher assessment	02
12.	Presentations by the Students: Self-Peer-teacher assessment	02
13.	Discussion on Modern Day Communication	02
14.	Modern Day Communication and Contemporary Society	02
15.	Exploring Innovative Communication Tools for effective communication	02

Text Book (s)

Title	Author/s	Publication
Practical Techniques to Develop Communication Skills	Parul Popat&KaushalKotadia	PothiPrakashan, 2015

Reference Books:

Title	Author/s	Publication
Communication Skills	Parul Popat&KaushalKotadia	Pearson, 2015
Communication Skills, Second Edition	Sanjay Kumar, PushpLata	Oxford University Press,2015
Communication Skills for Engineers	Sunita Mishra	Pearson, 2011
Effective Interpersonal and Team Communication Skills for Engineers	Clifford Whitcomb, Leslie E. Whitcomb	John Wiley & Sons, 2012

Web Material Links:

- <http://www.mindtools.com/page8.html>
- http://techpreparation.com/soft-skills.htm?gclid=CJf34fyQv5wCFdMtpAodjX_tA
- <http://lorien.ncl.ac.uk/ming/Dept/Tips/present/comms.htm>

Course Evaluation:**Theory:**

- Continuous Evaluation Consist of Two Test Each of 15 Marks and 1 Hour of duration.
- Submission of assignment which consists of 5 Questions to be answered under each module and it carries 10 Marks of Evaluation.
- End Semester Examination will consist of 60 Marks Exam.

Practical/Tutorial:

- Continuous Evaluation Consist of Performance of Practical/Tutorial which should be evaluated out of 10 for each practical/Tutorial in the next turn and average of the same will be converted to 15 Marks.
- Internal Viva component of 10 Marks.
- Practical performance/quiz/drawing/test of 15 Marks during End Semester Exam.
- Viva/Oral performance of 10 Marks during End Semester Exam.

Course Outcomes:

Students will be able to

1. Follow the process of communication and its components in organizational context.
2. Express themselves and to participate in the classroom discussions and other such academic or academic support activities.
3. Comprehend whatever they receive from Informal Interactions with the family, teachers and friends; and from Formal Communications taking Place in Lectures, Laboratories and the like.
4. Communicate effectively using suitable styles and techniques.
5. Express themselves through the modern modes of communication and to participate in the group discussions and other such academic or academic support activities.
6. Use language effectively with reference to communication in groups and group behavior.
7. Understand and use latest and innovative communication tools to enhance their communication efficacy.

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SCHOOL OF SCIENCES

ACADEMIC RULES AND REGULATIONS

1. Abbreviations:

SOS: School of Sciences

2. Course Coordinator

A faculty member, within university, who is responsible for all the activities related to a particular course such as syllabus completion, internal evaluation, exam coordination etc.

3. Course Evaluation

All Courses/Subjects offered at P P Savani University shall be evaluated under two heads:

- a. **Continuous Evaluation (CE)** component which is under sole discretion of the course coordinator. It is expected that the continuous evaluation should consist of Unit Test/ Weekly Test/ Fortnightly Test/ Class Test/ Presentations/ Project Work/Assignment/ Group Discussion/ Quiz/ Seminar/ Debate etc.
- b. The marks of CE component should be submitted by course coordinator to University Exam Section in the format prescribed by the University.
- c. The course coordinator shall submit the answer sheets along with the final marks after showing the same to the students within 07 days of the Examination.
- d. **The maximum mark of Continuous Evaluation (CE) component is 40 percent.**
- e. **End Semester Examination (ESE)** will be conducted by University through written paper or practical test or oral test or presentation by the student or a combination of any one, two or more of these.
- f. The End Semester Examination will be evaluated by appointing two subject experts, One from outside University and another from within University, for all courses offered under University.
- g. **The maximum mark of End Semester Examination is 60 percent.**
- h. The total of the Continuous Evaluation Component and End Semester Examination marks in each course will be converted to a letter grade on a ten-point scale as per the following scheme:

Percentage of Marks	Grade for SOE/SOM/SOS	Grade Point
90-100	O	10
80-89.99	A+	9
70-79.99	A	8
60-69.99	B+	7
50-59.99	B	6
40-49.99	C	5
< 40%	F	0

- i. In order to earn the credit in a course a student has to obtain grade other than F.
- j. A student, who remains "Absent" in University Exam will be awarded F grade.

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- k. A student, who obtains F grade, has to appear for Re-Test of university examination scheduled immediately after declaration of result. In case the candidate secures grade other than F, he/she will be awarded maximum grade of B+ after retest.
- l. A student, who obtains F grade, after Re-Test of university examination, has to repeat the university examination of the same course(s) till he/she obtains grade other than F.
- m. No student is allowed to upgrade the grade, if he/she scored grade other than F.
- n. The student's performance in any semester will be assessed by the Semester Grade Point Average (SGPA). Similarly, his/her performance at the end of two or more consecutive semesters will be denoted by the Cumulative Grade Point Average (CGPA). The SGPA and CGPA are calculated as per guidelines of UGC.
- o. In a semester, the SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student, i.e.
$$SGPA (S_i) = \frac{\sum(C_i \times G_i)}{\sum C_i}$$
Where, C_i is the number of credits of the i th course and G_i is the grade point scored by the student in the i th course.
- p. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme, i.e.
$$CGPA = \frac{\sum(C_i \times S_i)}{\sum C_i}$$
Where, S_i is the SGPA of the i th semester and C_i is the total number of credits in that semester.
- q. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the grade-card & transcript.

4. Promotion Rules

- a. All the students of odd semester are allowed to move to even semester irrespective of their results.
- b. At the end of a year, a student is not allowed to move to odd semester in case of his/her CGPA is less than 3.00.
- c. Over and above, the school has to follow the guidelines laid down by the statutory body time to time.
- d. The detained students will have to register for all the failed courses of previous two semesters with course fees worth Rs. 3000/- per course.

5. Examination Schedule

Each School shall decide and design the University Examination Schedule within one month of the beginning of the Semester. However, it shall be prepared in consultation with the Exam Section of the University.

6. Conduction of Examination

Each question paper shall comprise of 02 Sections, equally divided in terms of marks. Each question paper shall carry 60 % easy, 20 % moderate and 20 % difficult questions. The exam will be conducted primarily in the Answer sheet of 24 pages. If needed, the student may be provided with a supplementary of 04 pages. Each section will be written in different Answer sheet.

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Each course/ subject is divided into 60 % and 40 % as ESE and CE respectively. 40 % CE will be carried out by the respective school/ department. Moreover, the Course Coordinator will submit the CE marks to the Exam Section after the due verification by the respective Head/ Principal within 07 days of the completion of the Internal Examination.

- a. Examination Order: The Exam Section will send the exam order to both – Internal and External examiner via E mail at least two months prior to the schedule anticipating the confirmation of arrival with the course coordinator. The order shall carry the theory and practical examination date.
- b. Paper setter: The internal and the external examiner will set both the sections separately consisting of equal marks distribution of total weightage of question paper. It shall be submitted in hard as well as soft copies. The exam section will randomly select one section from both the submitted question papers. The remaining paper shall be utilized for the remedial examinations.
- c. The External Examiner will be sent the syllabus along with the format of question paper. He/she will also be informed about the online submission of the question paper with the assessment scheme and answer keys.
- d. The internal and external examiner shall assess the section 01 and 02 respectively. The examiners shall complete the assessment within 07 days of the date of exam.
- e. The final marks of University Theory Exam will be entered by the Exam Section with double layer verification. However, final marks of internal exam will be entered/ submitted by internal examiner followed by the verification by the course coordinator within 07 days.
- f. The minimum passing criteria for any (theory/ practical) Examination is 40 % of ESE as well as 40 % of overall marks.
- g. The internal examiner will enter the internal and external marks of practical examination on the same day of practical examination on the portal.
- h. For the backlog students, the re-exam will be scheduled only in the next University Semester End Examination.

7. UFM (Unfair Means):

No candidate/ examinee shall use unfair means or indulge in disorderly conduct at or in connection with examinations.

Unfair Means shall include the following:

1. During examination time having in possession or access to
 - a) Any paper, book, note or any other material (relevant or irrelevant).
 - b) Mobile Phones or any electronic gadget other than scientific calculator, even in switch off mode, which can potentially be used for communication or copying.
 - c) Anything written on any other instrument or any kind of furniture or any other substance which may have relevance to the syllabus of the examination paper concerned.
 - d) Anything written or signs made on the body of the candidate or his/her clothes/garments, handkerchief etc which may have relevance to the syllabus of the examination paper concerned.

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- e) Anything written on the question paper which may have relevance to the syllabus of the examination paper concerned.
2. Giving or receiving assistance in answering the question papers to or from any other candidate/person in the examination hall or outside during the examination hours.
 3. Talking to another candidate or any unauthorized person inside or outside the examination room during the examination hours without the permission of the invigilating staff.
 4. Swallowing or attempting to swallow or destroying or attempting to destroy a note or paper or any other material.
 5. Impersonating any candidate or getting impersonated by any person for taking the examination.
 6. If the candidate is found reading or possess some incriminating material relevant to the syllabus of the paper in verandah, urinal etc during his/her examination duration.
 7. If the behavior of the candidate on being caught is unsatisfactory or the candidate uses resistance/violence against the invigilator or any person on examination duty or consistently refuses to obey the instructions.

UFM Process & Review:

If a candidate is found practicing any of above mentioned Unfair Means:

- a. UFM report to be filed by Jr & Sr Supervisor of the centre.
- b. He/she should be allowed to complete the same exam without giving any extra time.

In case of UFM in the University Examination, the Provost will form a committee after the completion of the Examination for the same school. After the exam, the committee shall conduct an interaction with the concerned Jr & Sr Supervisor, the candidate & parents. The committee shall submit the report of the same next day of the interaction.

Norms of Punishment:

The following norms for punishment are laid down, if found guilty by the committee formed by the Provost.

Type of UFM practiced	Punishment to be imposed
<p>1. During examination time having in possession or access to</p> <ol style="list-style-type: none">a) Any paper, book, note or any other material (relevant or irrelevant).b) Mobile Phones or any electronic gadget other than scientific calculator, even in switch off mode, which can potentially be used for communication or copying.c) Anything written on any other instrument or any kind of furniture or any other substance which may have relevance to the syllabus of the examination paper concerned.d) Anything written or signs made on the body of the candidate or his/her clothes/garments, handkerchief etc which	<p>The candidate will be awarded F Grade in 02 courses: one in which he is found guilty and second in which he has scored minimum marks other than F & to be declared as Pass.</p>

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<p>may have relevance to the syllabus of the examination paper concerned.</p> <p>e) Anything written on the question paper which may have relevance to the syllabus of the examination paper concerned.</p>	
<p>2. Giving or receiving assistance in answering the question papers to or from any other candidate/person in the examination hall or outside during the examination hours.</p>	<p>His/her examination result in that course will be cancelled and F grade will be awarded in that course.</p>
<p>3. Talking to another candidate or any unauthorized person inside or outside the examination room during the examination hours without the permission of the invigilating staff.</p>	<p>His/her examination result in that course will be cancelled and F grade will be awarded in that course.</p>
<p>4. Swallowing or attempting to swallow or destroying or attempting to destroy a note or paper or any other material.</p>	<p>The candidate will be awarded F Grade in 02 courses: one in which he is found guilty and second in which he has scored minimum marks other than F & to be declared as Pass.</p>
<p>5. Impersonating any candidate or getting impersonated by any person for taking the examination.</p>	<p>The candidate will be awarded F Grade in 02 courses: one in which he is found guilty and second in which he has scored minimum marks other than F & to be declared as Pass.</p>
<p>6. If the candidate is found reading or possess some incriminating material relevant to the syllabus of the paper in verandah, urinal etc during his/her examination duration.</p>	<p>The candidate will be awarded F Grade in 02 courses: one in which he is found guilty and second in which he has scored minimum marks other than F & to be declared as Pass.</p>
<p>7. If the behavior of the candidate on being caught is unsatisfactory or the candidate uses resistance/violence against the invigilator or any person on examination duty or consistently refuses to obey the instructions.</p>	<p>The candidate will be awarded F Grade in all course of the semester in which he/she has appeared for examination.</p>

8. Result Declaration:

- a. The Exam Section will declare the result within 07 days of the completion of the examination.
- b. After the declaration of the results, the student can apply for rechecking or reevaluation within 03 days of the declaration of the result with payment as under:
 - Rechecking: Rs. 200/- per course
 - Reassessment: Rs. 500 per course
- c. Results for rechecking or reassessment will be declared on 8th day of the declaration of the original result. It will be declared prior to the commencement of University Retest.

The School of Sciences at PP Savani University reserves the right to make final decisions to change in the credit systems, academic programs and timetables.