



**P P SAVANI**  
**UNIVERSITY**  
**SCHOOL OF SCIENCES**

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**STUDENT HANDBOOK**  
**2020-21**



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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.

**Ph.D.** Biotechnology/Microbiology/Chemistry  
**M.Sc.** Biotechnology/Microbiology/Chemistry, PGDMLT  
**B.Sc. (Honours)** Biotechnology/Microbiology/Chemistry/IT/Fire and Safety/IT  
NH10, Near Biltech Company, Village: Dhamdod, Kosamba, Ta: Mangrol, Dist: Surat – 394125  
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## **MESSAGE FROM THE DIRECTOR**

School of Sciences, P P 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 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, P P 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, P P Savani University, Surat should be available to all the students of our University. In the near future it is envisioned that School of Sciences, P P 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. Vallabhbhai 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, P P Savani University, Surat, India is one of the best universities in life 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. Of course, students along with delegates of different states are also welcome. The education and research system of the School of Sciences has a major feature. While there are only five courses including Biotechnology, Microbiology, Chemistry, Environmental Science, Information Technology, and Fire Safety which covers various biological aspects including technology and somehow covers life environmental science, in order to comprehensively explore cutting-edge life science. Although there are many young dynamic and experienced teachers on our staff related to this field, this school chooses to open these courses for a good reason. 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 THE PRINCIPAL**

A country's vision is shaped and executed by its Education system which produces individuals capable of ushering the country in a new future. As such, the higher education plays an important role in Nation building through the various contributions in all fields of research and development. They pave the way for competing in the global competition.

We welcome you to the School of Sciences, PP Savani University. The School of Sciences was established in 2016 with a vision to provide quality education in the highly demanding areas of Biology, Chemistry, and Environment Science. The mission of School of Sciences was to hone the young minds in both Basic and Applied Sciences. The idea was to provide a cross-platform learning to students so as to encourage multidisciplinary research as science cannot be viewed in a single spectrum and a holistic approach leads to an overall understanding of Sciences.

PP Savani University provides a distinctive platform of learning in various disciplines of Sciences. Predominantly, the research oriented academic culture equips the student with theoretical as well as practical knowledge which extends to genetic engineering, microbiology, computational biology, chemistry and environmental sciences. The labs are equipped with modern tools thereby availing the students with the latest technology in their field.

School of Sciences, along with its traditional offerings has branched to B.Sc., M.Sc., and PhD programs in the domains of Biotechnology, Microbiology, Chemistry, Environmental Science and Fire Safety

### **Our Vision:**

1. To raise scientific awareness, sensitization, socio ethical acceptance and adoption to the potentials and application of biology.
2. To ensure the holistic development of students.
3. To provide institutional, legal financial, and policy support to students.
4. To develop students in sync with the competing environment.

Concluding this message from the Head of School, I would like to state a quote which reflects the culture at School of Sciences, PP Savani University.

**“Education is the most powerful weapon which you can use to change the world.” — Nelson Mandela**

**Dr. Anish Kumar Sharma (Ph.D)**  
**I/C Principal**



## **PROGRAMMES OFFERED AT UNIVERSITY**

- **M.Sc. Biotechnology**
- **M.Sc. Microbiology**
- **M.Sc. Chemistry**
- **M.Sc. Computer Science**
- **M.Sc. Integrated (Biotechnology, Microbiology)**
- **PGDMLT**
- **B.Sc. (H.) Biotechnology**
- **B.Sc. (H.) Microbiology**
- **B.Sc. (H.) Environment Science**
- **B.Sc. (H.) Chemistry**
- **B.Sc. (H.) Fire and Safety**
- **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**
- **Bachelor of Business Administration**
- **Bachelor of Arts**

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## **FACULTY PROFILES**

**Anish Kumar Sharma** (Ph.D.) is working as the I/C Principal, School of Sciences at P P Savani University. Dr. Sharma has pursued his Ph.D. in major subject of Molecular Biology and Biotechnology with minor subject Microbiology and have qualified GATE Biotechnology in 2011 with (AIR-151 and 99.01 percentile), ICAR-(ARS-NET) in 2013 (67%), CSIR-NET examination in 2013 with AIR-33 and ICAR (ARS-NET) again in



2018 (60%). He has published research papers in National as well as International journals. He submitted 10 nucleotide DNA sequence in NCBI. He has membership of various reputed International and National Science Societies. He has attended as well as participated in many National & International conferences, workshops, trainings and Faculty Development Programs. He won Best Poster award at International Symposium on Emerging Biological Trends in 21<sup>st</sup> Century held at P P Savani University (Surat, Gujarat) co-sponsored by GSBTM & he got 2<sup>nd</sup> Prize in Oral Presentation at 2<sup>nd</sup> International Conference-Food Security, Nutrition and Sustainable Agriculture-Emerging Technologies held on 14<sup>th</sup> -16<sup>th</sup> February, 2019, organized jointly by Baba Farid College (Bathinda, Punjab) & Indian Institute of Food Processing Technology (IIFPT) sponsored by Ministry of Food Processing Industries (MOFPI) (GOI) and Society of Pharmacognosy & Phytochemistry. He has been working as a resource person at GSBTM Sponsored PGBTCBC Crash Workshop for PG Students, Research Scholars and Academicians on CSIR-UGC-NET/JRF organized by Shree M. & N. Virani Science College, Rajkot since 2019.

His area of interest lies in Plant Biotechnology, Microbial Molecular Biology and Environmental Biotechnology. Besides academic and research activities, Dr. Sharma is an active sportsperson and he loves to play cricket, table tennis, chess, and volleyball.

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**Dr. Vishal Singh Negi** (Ph.D.) is an Assistant Professor in the Department of Biotechnology / Microbiology, School of Sciences at the P P Savani University. He is a Ford Fellow from the United States of America. 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. Hiren K. Patel** (Ph.D.) presently working as an assistant Professor, 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





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biotechnology, Microbial Biotechnology, Environmental Biotechnology, Bioaugmentation and Enzyme Technology.

**Dr. Archana Negi** (Ph.D.) is an Assistant Professor in the Department of Biotechnology / Microbiology, School of Sciences at the P P 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 International Center for Genetic Engineering and Biotechnology, New Delhi, 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.

**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

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interests as well. She is an accomplished Kathak and Bharatnatyam dancer and actively participates in cultural and social activities.

**Dr. Aditee Pandya** (Ph.D) is an Assistant Professor in the Microbiology, Department of the School of Sciences of P P Savani University. She has pursued her Doctoral in Microbiology from Maharaja KrishnaKumarsinhji Bhavnagar University. Dr. Aditee, Mycologist, Researcher, Reviewer and Editorial member of several National and International journal and also published many International and National Papers and Books, has organized many National conferences and workshops and have guided many UG and PG students in Dissertation, won first prize at National level Oral Presentation. Has served as Resource Person for preparation of JNU competitive exams sponsored by GSBTM and KCG SANDHAN. Her area of expertise lies in Environmental Microbiology, Food & Water Microbiology, Microbial Diversity, Industrial Microbiology, Medical Microbiology, Bioremediation and Xenobiotics.



**Dr. Aparna Singh** (PhD) is currently working as Assistant Professor at Department of Microbiology, School of Sciences, P.P. Savani University, Kosamba, Surat, India. She has pursued her graduation (Botany-Zoology-Chemistry group), post-graduation (Microbiology) and Ph.D (Microbiology) from The Maharaja Sayajirao University of Baroda, Vadodara, Gujarat, India. She has worked as post doctoral fellow for two years at Central University of Hyderabad, Hyderabad, Telangana, India. During the tenure of post doctoral research she was awarded with many prestigious fellowships including DBT-CREEB, IISC-DBT-RA and UGC-D. S. Kothari post doctoral fellowships. Dr. Aparna Singh was working as DST Women Scientist-A till 2018 at Department of Microbiology, The Maharaja Sayajirao University of Baroda, Vadodara.



She has cleared CSIR NET (all India rank 11), GSET, ICAR NET, CCC and GATE. She holds good experience in research and academics as revealed by number of publications and awards

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as well as seminars/conferences and workshops attended. Currently she has 9 publications including book chapters, reviews and original research articles all in peer-reviewed international journals. Her current h-Index is 8 and i10-Index is 7 with total 218 citations. She has been working as resource person at GSBTM Sponsored PGBTCBC Crash Workshop for PG Students, Research Scholars and Academicians on CSIR-UGC-NET/JRF organized by Shree M. & N. Virani Science College, Rajkot since 2018.

Her research interest is in halophilic archaea and quorum quenching marine bacteria.

**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.

**Dr. Sadafara Pillai** (PhD) is an Assistant Professor at the Department of Chemistry, School of Sciences, at the P. P. Savani University. She has done her Ph.D. in the major subject of Chemistry (specialization in Physical Chemistry) from Veer Narmad South Gujarat University, Surat. She is a university topper in her post-graduation (PG) course and recipient of prestigious UGC fellowships; Maulana Azad National fellowship (for pursuing Ph.D.)



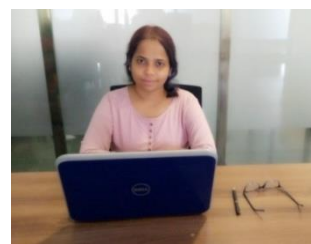
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and Dr. D. S. Kothari Post doctoral Fellowship (for postdoctoral research). She is engaged in the research field of surface, colloid and polymer science and published many research papers in reputed international journals in collaboration with several leading professors abroad and scientists in India. In addition, she has delivered expert talks and presented papers in various national/ international conferences and prestigious institutes like Institute of Chemical Technology, Bhabha Atomic Research Centre to name a few.

**Dr. Sheetal Kamble** (PhD) is an Assistant Professor in the Environmental Science department of the School of Sciences of P.P Savani University. She has pursued her Doctoral in Environmental Engineering and Management from National Institute of Industrial Engineering (NITIE), Mumbai. She has published more than 15



research papers in International journals of repute. She has presented more than 10 research papers in several National/ International conferences. She has assisted in completing 2 multi-institutional international research projects entitled “The Development of Guidelines and Decision Support System for Waste Water Treatment Plants, Supporting Consolidation, Replication and Up-Scaling of Sustainable Wastewater Treatment and Reuse Technologies for India”, SARASWATI” funded by EU-DST and the “Evaluation of climate change impacts and suitable adaptation strategies for crop production and its environmental and economic implications in vulnerable regions of Thailand and India”. Her areas of interests in teaching and research are Life cycle assessment, Sustainability, Wastewater treatment, Solid waste management, Environmental impact assessment, Biodiversity and Conservation, Circular economy and Multi-criteria decision making.

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**Ms. Prablin Kaur Ghura** is an Assistant Professor in Environmental Science Department in School of Sciences, P. P. Savani University. She has pursued her B.E (Environmental Engineering) from Dr. S & S. S. Ghandhy Government College of engineering, Surat and M.E. (Environmental Engineering) from The Maharaja Sayajirao University, Baroda. She has worked in the field of anaerobic biodegradation of Solvent dyes during her M.E Dissertation.



She was also a former Environmental Engineer in Industry, handling the anaerobic unit in the industrial plant. She was awarded 2nd while presenting her research in INTERLINKING OF ACADEMICIAN, INDUSTRIES & GOVERNMENT THROUGH INTEGRATION OF RESEARCH TO INDUSTRIAL APPLICATION PROJECT” of GCPC (Gujarat Cleaner Production Centre), supported by Forests & Environment Department, Government of Gujarat by Dr. Bharat. P Jain (Member Secretary, GCPC). She has attended various national conferences and workshops based on Emerging issues and challenges in Water Pollution and Wastewater treatment. She has also published her research in national and international journals. She has also achieved certification in training on Laboratory Management System and Internal Auditing as per ISO/IEC 17025:2017 at Surat, Gujarat. She has also organized a Industrial visit to Sewage Treatment plant of Surat Municipal Cooperation for Environmental Sciences Students and will continue to arrange much more.

She has also guided various students regarding events like Poster presentations for National conference. Her area of interest lies in anaerobic treatment of wastewater, Solid Waste Management, Analysis of various Wastewater parameters and Environment Audit.

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**Mr. Sagarkumar Joshi** is an Assistant Professor in the Microbiology, School of Sciences, P P Savani University. He did his Masters in Microbiology from Gujarat University. His area of interest lies in Microbial resources for sustainable energy, Microbial Diversity of extreme environment, and Microbial bioremediation. He guided UG and PG Students of Microbiology for various short term research projects. He was organizing comity member for various scientific workshops and conferences.



**Mrs Khyati Harkhani** is a Teaching Assistant in the Biotechnology Department of the school of science of P. P. Savani University, Surat. She has pursued her Masters in Biotechnology from Institute of Science, Nirma University, Ahmedabad. She is awarded with Gold Medal for her Master from Nirma University. She has qualified GSET 2018 in Life Science and GATE 2013 in Biotechnology. She has presented the review paper in National Seminar in field of Biotechnology. She has attended many national conferences and seminars and workshops in field of Biotechnology. Her area of interest is immunology, molecular biology, Genetics.





## **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.





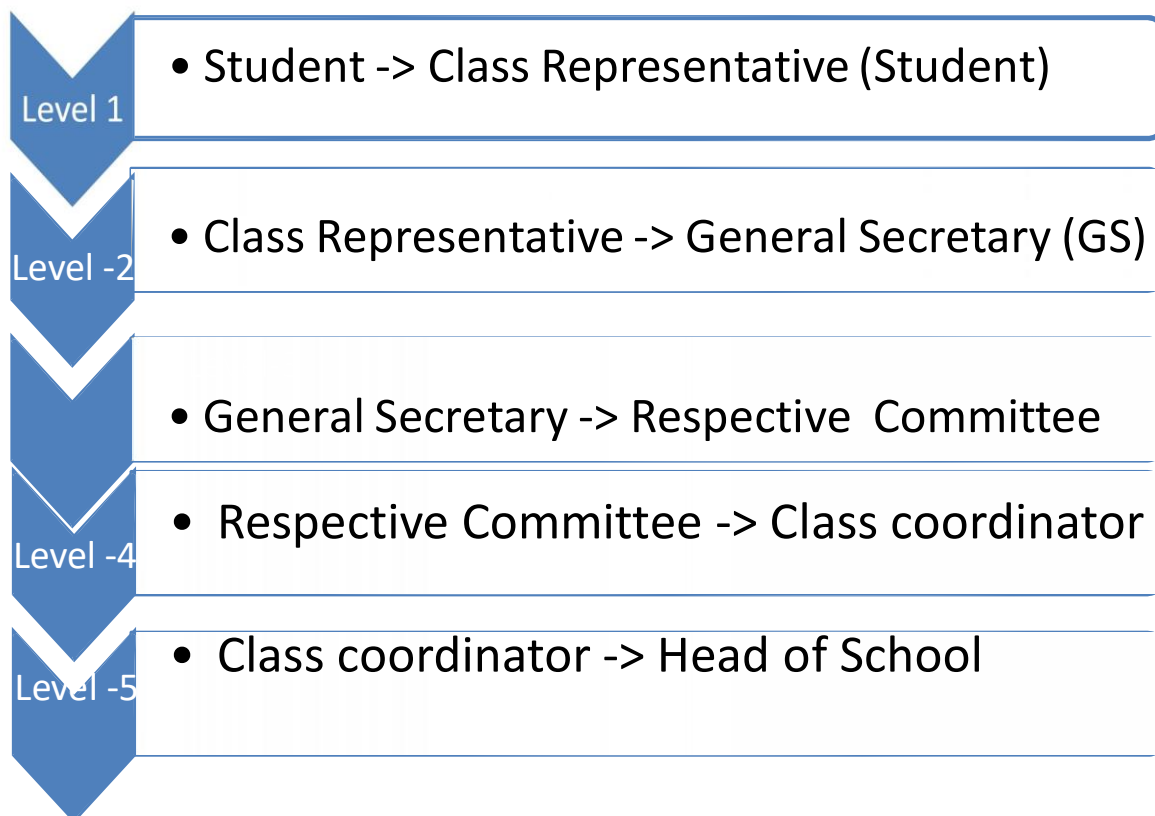
## **FACULTY DETAILS**

<b>Sr. No.</b>	<b>Faculty Name</b>	<b>Contact Details</b>	<b>Abbreviation</b>
1.	Dr. Anish Sharma	Mo.No.: 07434061063 Email Id: <a href="mailto:anish.sharma@ppsuh.ac.in">anish.sharma@ppsuh.ac.in</a>	AKS
2.	Dr. Vishal Singh Negi	Mo.No.: 06355720256 Email Id: <a href="mailto:vishal.negi@ppsuh.ac.in">vishal.negi@ppsuh.ac.in</a>	VN
3.	Dr. Hiren Patel	Mo. No.: 09512035616 Email Id: <a href="mailto:hiren.patel@ppsuh.ac.in">hiren.patel@ppsuh.ac.in</a>	HP
4.	Dr. Archana Negi	Mo.No.: 06355460976 Email Id: <a href="mailto:archana.negi@ppsuh.ac.in">archana.negi@ppsuh.ac.in</a>	AN
5.	Dr. Sangha Bijekar	Mo.No.: 08087118509 Email id: <a href="mailto:sangha.bijekar@ppsuh.ac.in">sangha.bijekar@ppsuh.ac.in</a>	SB
6.	Dr. Aditee Pandya	Mo.No.: 09687657444 Email Id: <a href="mailto:aditee.pandya@ppsuh.ac.in">aditee.pandya@ppsuh.ac.in</a>	AP
7.	Dr. Aparna Singh	Mo.No.: 07984945541 Email Id: <a href="mailto:aparna.singh@ppsuh.ac.in">aparna.singh@ppsuh.ac.in</a>	AS
8.	Dr. Bharat Solanki	Mo.No.: 09725900396 Email Id: <a href="mailto:bharat.solanki@ppsuh.ac.in">bharat.solanki@ppsuh.ac.in</a>	BS
9.	Dr. Sadafara Pillai	Mo.No.: 09913337995 Email Id: <a href="mailto:sa.pillai@ppsuh.ac.in">sa.pillai@ppsuh.ac.in</a>	SP
10.	Dr Sheetal Kamble	Mo.No.: 9702481206 Email Id: <a href="mailto:sheetal.kamble@ppsuh.ac.in">sheetal.kamble@ppsuh.ac.in</a>	SK
11.	Ms Prablin Kaur	Mo.No.: 09723677456 Email Id: <a href="mailto:prablin.kaur@ppsuh.ac.in">prablin.kaur@ppsuh.ac.in</a>	PK
12.	Mrs Khyati Harkhani	Mo.No.: 09328895966 Email Id: <a href="mailto:khyati.harkhani@ppsuh.ac.in">khyati.harkhani@ppsuh.ac.in</a>	KH
13.	Mr. Sagar Joshi	Mo.No.: 08980023577 Email Id: <a href="mailto:sagar.joshi@ppsuh.ac.in">sagar.joshi@ppsuh.ac.in</a>	SJ



## **GRIEVANCE REPORTING SYSTEM**

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



# Syllabus

# PP Savani University

## School of Sciences

### Syllabus, Teaching and Examination Scheme

**Course Name:** Introduction to Biotechnology-I

**Course Code:** SSBT1010

**Prerequisite:** Nil

#### Teaching and Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)		
Theory	Practical	Tutorial	Credit	CE	ESE	Total
2	0	0	2	40	60	100

CE: Continuous Evaluation, ESE: End Semester Examination

#### Objective(s) 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 acrossworld

#### Course Contents:

Section-I			
Module	Content	Hours	Weightage (%)
1	Plant-Introduction and outline classification of angiosperms, Gymnosperms, Pteridophytes, Bryophytes	12	25
2	Animal- Introduction and outline classification non-chordates (Prolifera to Echinodermates) and chordates	13	30
Section-II			
3	Viruses- Structure and Classification, Virions, Prions	08	20
4	Biotechnology: definitions, an interdisciplinary pursuit. Traditional and Modern Biotechnology Three central core components of Biotechnology Product safety, Public perception of Biotechnology, Scope of Biotechnology, Definition of genetic engineering & cloning	12	25

#### Reference Books:

Title	Authors	Publisher
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 Name:** Introduction to Biotechnology-II

**Course Code:** SSBT1020

**Prerequisite:** Nil

**Teaching and Examination Scheme:**

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)		
Theory	Practical	Tutorial	Credit	CE	ESE	Total
2	0	0	2	40	60	100

CE: Continuous Evaluation, ESE: End Semester Examination

**Objective(s) 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 acrossworld

**Course Contents:**

Section-I			
Module	Content	Hours	Weightage (%)
1	Transgenics, Fundamentals of Plant Biotechnology: Transgenic plants (GM Papaya, GM Tomato), Biotic and abiotic Resistant Plants developed, BT Cotton, golden rice and BTBrinjal Pros and Cons	12	25
2	Fundamentals of Animal Biotechnology: Transgenic animals and Livestock Improvements, Dolly sheep, Stem cell research	11	25
Section-II			
3	Fundamentals of Microbial Biotechnology: Industrial important microbes and derived products.	11	25
4	Biotechnology Research in India. Biotechnology Institutions in India (Public and Private Sector), Biotech Success Stories Biotech Policy Initiatives Biotechnology in context of Developing World, Introduction to DBT, Autonomous institutions of DBT, Public sector undertaking of DBT, BITS-NET, Introduction to ABLE	11	25

## Reference Books:

Title	Authors	Publisher
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 Name:** Biotechnology practical

**Course Code:** SSBT1030

**Prerequisite:** Nil

## Teaching and Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)		
Theory	Practical	Tutorial	Credit	CE	ESE	Total
2	0	0	2	40	60	100

CE: Continuous Evaluation, ESE: End Semester Examination

## Objective(s) 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 acrossworld

## Course Contents:

Section-I		
Module	Content	Hours
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
1	Principle working & uses of following laboratory instruments: Microscope, Incubator, pH meter,	3

### Reference Books:

Title	Authors	Publisher
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



# PP Savani University

## School of Sciences

### Syllabus, Teaching and Examination Scheme

**Course Name:** Introduction to Microbiology-I

**Course Code:** SSMB1010

**Prerequisite:** Nil

#### Teaching and Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)		
Theory	Practical	Tutorial	Credit	CE	ESE	Total
2	0	0	2	40	60	100

CE: Continuous Evaluation, ESE: End Semester Examination

#### Objective(s) 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 Contents:

Section-I			
Module	Content	Hours	Weightage (%)
1	History and scope of Microbiology, Introduction to microorganisms, Discovery, Types of microbes, Golden period of microbiology, Scope and future of microbiology	12	25
2	Bacterial Diversity: General characteristics of Bacteria, archaea, cyanobacteria. Classification and economic importance	11	25
Section-II			
3	Fungal Diversity: General characteristics of fungi including habitat, distribution, nutritional requirements, fungal cell ultra-structure, thallus organization and aggregation, Classification and Economic and importance of fungi	11	25
4	Algal Diversity: General characteristics of algae including occurrence, thallus organization, algae cell ultra-structure, Classification and Economic importance of algae	11	25

#### Reference Books:

Title	Authors	Publisher
Microbiology	Prescott	McGraw-Hill
Microbiology	Peleczar	Tata McGraw-Hill
General Microbiology	StanierRY, Ingraham JL, Wheelis ML, and Painter PR	5 <sup>th</sup> edition. McMillan (2005)
Experiments in Microbiology, Plant Pathology and Biotechnology	Aneja	New Age Publisher
Microbiology Introduction	Tortora Gerad	Benjamin Cumming

**Course Name:** Introduction to Microbiology -II

**Course Code:** SSMB1020

**Prerequisite:** Nil

**Teaching and Examination Scheme:**

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)		
Theory	Practical	Tutorial	Credit	CE	ESE	Total
2	0	0	2	40	60	100

CE: Continuous Evaluation, ESE: End Semester Examination

**Objective(s) 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 Contents:**

Section-I			
Module	Content	Hours	Weightage (%)
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	15	30
2	Major cell Morphologies, Morphology and Biology, Cell size and significance of smallness, Significance of surface to volume ratio, Lower limits of cell size.	11	25
Section-II			
3	Bacterial cell surface appendages, Pili, Fimbriae, Cell inclusions, Gas Vesicles, Endospores, Nucleoid, Chemotaxis, Structures responsible for motility in bacteria, Types of motility	11	25

4	Concept of Microscopy-resolution, simple and compound microscopy, various types of microscopy	08	20
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### Reference Books:

Title	Authors	Publisher
Microbiology	Prescott	McGraw-Hill
Microbiology	Peleczar	Tata McGraw-Hill
General Microbiology	Stanier RY, Ingraham JL, Wheelis ML, and Painter PR	5 <sup>th</sup> edition. McMillan (2005)
Experiments in Microbiology, Plant Pathology and Biotechnology	Aneja	New Age Publisher
Microbiology Introduction	Tortora Gerard	Benjamin Cumming

**Course Name:** Microbiology practical

**Course Code:** SSMB1030

**Prerequisite:** Nil

### Teaching and Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)		
Theory	Practical	Tutorial	Credit	CE	ESE	Total
0	4	0	2	40	60	100

CE: Continuous Evaluation, ESE: End Semester Examination

### Objective(s) 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 Contents:

Section-I		
Module	Content	Hours
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

### Reference Books:

Title	Authors	Publisher
Microbiology	Prescott	McGraw-Hill
Microbiology	Peleczar	Tata McGraw-Hill
General Microbiology	Stanier RY, Ingraham JL, Wheelis ML, and Painter PR	5 <sup>th</sup> edition. McMillan (2005)
Experiments in Microbiology, Plant Pathology and Biotechnology	Aneja	New Age Publisher
Microbiology Introduction	Tortora Gerard	Benjamin Cumming

# PP Savani University

## School of Sciences

### Syllabus, Teaching and Examination Scheme

**Course Name:** Introduction to **Environment Science-I**

**Course Code:** SSES1010

**Prerequisite:** Nil

#### Teaching and Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)		
Theory	Practical	Tutorial	Credit	CE	ESE	Total
2	0	0	2	40	60	100

CE: Continuous Evaluation, ESE: End Semester Examination

#### Objective(s) 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 Contents:

Section-I			
Module	Content	Hours	Weightage (%)
1	Multidisciplinary nature of environmental studies a) Definition, scope and importance 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
Section-II			
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. Food chains, food webs and ecological pyramids	08	30
4	Biodiversity and its conservation Introduction – Definition: genetic, species and ecosystem	08	25

<p>diversity. Value of biodiversity : consumptive use, productive use, social, ethical, aesthetic and option values. Biodiversity at global, National and local levels.</p> <p>a) Indian Biodiversity &amp; its importance (HotSpots)</p> <p>b) Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts.</p> <p>c) Endangered and endemic species of India</p> <p>Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.</p>		
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### Reference Books:

Title	Authors	Publisher
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
Microbiology Introduction	Tortora Gerad	Benjamin Cumming
Textbook of Engineering Chemistry (4 <sup>th</sup> Edition)	R. Gopalan, D. Venkappaya, S. Nagarajan	Vikas Publishing house Ltd.
Concise Inorganic Chemistry	J.D. Lee	Wiley India
Engineering Chemistry (16 <sup>th</sup> Edition)	P.C. Jain and Monika Jain	Dhanpat Rai publishing company

**Course Name:** Chemistry I

**Course Code:** SSES1020

**Prerequisite:** Nil

### Teaching and Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)		
Theory	Practical	Tutorial	Credit	CE	ESE	Total
2	0	0	2	40	60	100

CE: Continuous Evaluation, ESE: End Semester Examination

## Objective(s) 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 Contents:

Section-I			
Module	Content	Hours	Weightage (%)
1	<b>Structure of Atom:</b> 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.	6	25
2	<b>Chemical Bonding and Structure of Molecules:</b> <b>General terms:</b> Chemical bond, valence, valence electrons, Bonding and Non bonding electrons, Lewis symbols, Octet rule. <b>Ionic bond:</b> Definition, Condition for formation of ionic bond, Factors governing formation of ionic bond, Characteristics of ionic compounds. <b>Covalent bond:</b> 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. <b>Hydrogen bonding:</b> Definition, conditions for H-bond formation, examples, Types of H-bonds, Characteristics of H-bonded compounds. <b>Metallic bond:</b> Definition, The Electron sea model	8	25
Section-II			
3	<b>Acid and Bases:</b> 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	8	25



	analytical chemistry and biochemical processes in the human body. Numerical Problems.		
4	<b>Colloids</b> 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.	8	25

### Reference Books:

Title	Authors	Publisher
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
Microbiology Introduction	Tortora Gerad	Benjamin Cumming
Textbook of Engineering Chemistry (4 <sup>th</sup> Edition)	R. Gopalan, D. Venkappaya, S. Nagarajan	Vikas Publishing house Ltd.
Concise Inorganic Chemistry	J.D. Lee	Wiley India

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

**Course Code:** SSES1030

**Prerequisite:** Nil

### Teaching and Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)		
Theory	Practical	Tutorial	Credit	CE	ESE	Total
0	4	0	2	40	60	100

CE: Continuous Evaluation, ESE: End Semester Examination

### Objective(s) 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 Contents:

Section-I		
Module	Content	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 Practicals		
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 arsenious sulphide sol	6

## Reference Books:

Title	Authors	Publisher
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
Microbiology Introduction	Tortora Gerad	Benjamin Cumming
Textbook of Engineering Chemistry (4 <sup>th</sup> Edition)	R. Gopalan, D. Venkappaya, S. Nagarajan	Vikas Publishing house Ltd.
Concise Inorganic Chemistry	J.D. Lee	Wiley India

# Sem-2

# PP Savani University

## School of Sciences

### Syllabus, Teaching and Examination Scheme

**Course Name:** Cell Biology-I

**Course Code:** SSBT1040

**Prerequisite:** Nil

#### Teaching and Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)		
Theory	Practical	Tutorial	Credit	CE	ESE	Total
2	0	0	2	40	60	100

CE: Continuous Evaluation, ESE: End Semester Examination

#### Objective(s) of the Course:

To learn about cell and its organelles

To develop basic understanding for cellular structures and their functions

To make students understand process about cell division and cancer

#### Course Contents:

Section-I			
Module	Content	Hours	Weightage (%)
1	Discovery of cells, Basic properties of cells, Fundamental classes of cells: Prokaryotic (Bacterial cell, Archaeal cell), Eukaryotic cells (Plant and Animal), Viruses	10	20
2	Structure and various models of biological membranes, Organization and Fluid Mosaic Model, membrane as a dynamic entity, cell recognition and membrane transport.	12	25
Section-II			
3	Structure, composition and functions of: a) Membrane Vacuolar system, and cytoskeleton b) Endoplasmic reticulum Golgi complex	13	30
4	Structure, composition and functions of: a) Lysosomes b) Ribosomes c) Mitochondria d) Chloroplasts	10	25

e) Nucleus		
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**Reference Books:**

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

**Course Name:** Cell Biology -II

**Course Code:** SSBT1050

**Prerequisite:** Nil

**Teaching and Examination Scheme:**

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)		
Theory	Practical	Tutorial	Credit	CE	ESE	Total
2	0	0	2	40	60	100

CE: Continuous Evaluation, ESE: End Semester Examination

**Objective(s) of the Course:**

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

**Course Contents:**

Section-I			
Module	Content	Hours	Weightage (%)
1	The Cell cycle and its Regulation via various Checkpoints	10	25
2	Mitosis: cell division of somatic cell, Various Phases (Prophase, Prometaphase, Metaphase, Anaphase, Telophase), Forces required for Mitotic Movements, Cytokinesis	12	25
Section-II			
3	Meiosis: cell division of gametic cell, Various Phases in Meiosis I	13	25

	and Meiosis II, Genetic recombination during Meiosis		
4	Oncology: study of Cancer, types and molecular basis of cancer, Programmed cell death(PCD)	10	25

### Reference Books:

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

**Course Name:** Cell Biology practical

**Course Code:** SSBT1060

**Prerequisite:** Nil

### Teaching and Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)		
Theory	Practical	Tutorial	Credit	CE	ESE	Total
0	4	0	2	40	60	100

CE: Continuous Evaluation, ESE: End Semester Examination

### Objective(s) of the Course:

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

### Course Contents:

Section-I		
Module	Content	Hours
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-acis by Ninhydrin method	3
9	Microscopic observation of Drosophila compound eyes	3

### Reference Books:

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

# PP Savani University

## School of Sciences

### Syllabus, Teaching and Examination Scheme

**Course Name:** Fundamentals of Bacteriology -I

**Course Code:** SSMB1040

**Prerequisite:** Nil

#### Teaching and Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)		
Theory	Practical	Tutorial	Credit	CE	ESE	Total
2	0	0	2	40	60	100

CE: Continuous Evaluation, ESE: End Semester Examination

#### Objective(s) 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 Contents:

Section-I			
Module	Content	Hours	Weightage (%)
1	Nutritional Requirement of Bacteria, Needs of Carbon, Hydrogen, oxygen, Electrons, Nitrogen, Phosphorus, Sulfur	11	25
2	Types of microbes based on nutritional requirement, Growth factors, The nutrition cycles	11	25
Section-II			
3	Bacteriological techniques, Pure culture isolation: Streaking plate, serial dilution and plating methods; cultivation, maintenance and preservation/stocking of pure cultures	11	25
4	Concept and Types of Culture media: Chemical, Physical & Biological, Cultivation of anaerobic and aerobic bacteria	12	25

#### Reference Books:



Title	Authors	Publisher
Microbiology	Prescott	McGraw-Hill
Microbiology	Pelczar	Tata McGraw-Hill
Experimental Microbiology	Rakesh Patel	Aditya Prakashan
Experiments in Microbiology, Plant Pathology and Biotechnology	Aneja	New Age Publisher

**Course Name:** Fundamental of Bacteriology-II

**Course Code:** SSMB1050

**Prerequisite:** Nil

**Teaching and Examination Scheme:**

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)		
Theory	Practical	Tutorial	Credit	CE	ESE	Total
2	0	0	2	40	60	100

CE: Continuous Evaluation, ESE: End Semester Examination

**Objective(s) 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 Contents:**

Section-I			
Module	Content	Hours	Weightage (%)
1	Bacterial Cell cycle, Growth curve, Techniques for Bacterial Growth measurement	11	25
2	Batch and continuous culture of micro-organisms (Chemostat and Turbidostat), Microbial Growth in natural environments, Bio-films	11	25
Section-II			
3	Influence of Environment on Microbial growth (Solutes and water activity, pH, Temperature, Oxygen concentration, Pressure, Radiation)	11	25

4	Introduction to various biological macromolecules: carbohydrates, lipids, proteins and nucleic acids	12	25
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### Reference Books:

Title	Authors	Publisher
Microbiology	Prescott	McGraw-Hill
Microbiology	Pelczar	Tata McGraw-Hill
Experimental Microbiology	Rakesh Patel	Aditya Prakashan
Experiments in Microbiology, Plant Pathology and Biotechnology	Aneja	New Age Publisher

**Course Name:** Bacteriology practical

**Course Code:** SSMB1060

**Prerequisite:** Nil

### Teaching and Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)		
Theory	Practical	Tutorial	Credit	CE	ESE	Total
0	4	0	2	40	60	100

CE: Continuous Evaluation, ESE: End Semester Examination

### Objective(s) 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 Contents:

Section-I		
Module	Content	Hours
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

**Reference Books:**

<b>Title</b>	<b>Authors</b>	<b>Publisher</b>
Microbiology	Prescott	McGraw-Hill
Microbiology	Pelczar	Tata McGraw-Hill
Experimental Microbiology	Rakesh Patel	Aditya Prakashan
Experiments in Microbiology, Plant Pathology and Biotechnology	Aneja	New Age Publisher

# PP Savani University

## School of Sciences

### Syllabus, Teaching and Examination Scheme

**Course Name:** Introduction to Environment Science-II

**Course Code:** SSES1040

**Prerequisite:** Nil

#### Teaching and Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)		
Theory	Practical	Tutorial	Credit	CE	ESE	Total
2	0	0	2	40	60	100

CE: Continuous Evaluation, ESE: End Semester Examination

#### Objective(s) 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 Contents:

Section-I			
Module	Content	Hours	Weightage (%)
1	<b>Environmental Pollution:</b> Definition • Cause, effects and control measures of :- a) Airpollution b) Waterpollution c) Soilpollution d) Marinepollution e) Noisepollution f) Thermalpollution g) Nuclearhazards	08	25
2	<b>Social Issues and the Environment</b> 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
Section-II			
3	a) Environment Protection Act.	06	30

	b) Air (Prevention and Control of Pollution)Act. c) Water (Prevention and control of Pollution)Act d) Wildlife ProtectionAct Forest ConservationAct		
4	<b>Human Population</b> a) Population growth, variation among nations. b) Population explosion – Family Welfare Programme. Impact of Climate change on Environment and human health.	08	20

### Reference Books:

Title	Authors	Publisher
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 <sup>th</sup> Edition	Peter Atkins and Julio de Paula	Oxford University Press

**Course Name:** Chemistry-II

**Course Code:** SSES1050

**Prerequisite:** Nil

### Teaching and Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)		
Theory	Practical	Tutorial	Credit	CE	ESE	Total
2	0	0	2	40	60	100

CE: Continuous Evaluation, ESE: End Semester Examination

**Objective(s) 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 Contents:**

<b>Section-I</b>			
<b>Module</b>	<b>Content</b>	<b>Hours</b>	<b>Weightage (%)</b>
1	<p><b>Hydrocarbons</b> 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.</p>	8	27
2	<p><b>Fundamentals of reaction mechanism</b> 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.</p>	8	26
<b>Section-II</b>			
3	<p><b>Chemical Kinetics</b> 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, Pseudo order reactions, zero order reaction, Derivation rate constant equation for zero order reaction, First order reaction,</p>	8	27

	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		
4	<b>Thermodynamics</b> 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 conventions and units, First law of thermodynamics, enthalpy of system, Relation between $\Delta H$ and $\Delta E$ , Heat capacity, Specific and molar heat capacities, Concept of entropy, Entropy and its unit	6	20

### Reference Books:

Title	Authors	Publisher
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
<b>Chemistry Reference/textbooks Book:</b>		
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 <sup>th</sup> Edition	Peter Atkins and Julio de Paula	Oxford University Press

**Course Name:** Environment & Chemistry Practical-II

**Course Code:** SSES1060

**Prerequisite:** Nil

**Teaching and Examination Scheme:**

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)		
Theory	Practical	Tutorial	Credit	CE	ESE	Total
0	4	0	2	40	60	100

CE: Continuous Evaluation, ESE: End Semester Examination

**Objective(s) 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 Contents:**

Section-I		
Module	Content	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 Books:**

Title	Authors	Publisher
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Environmental Biology,	Agarwal, K.C.	Nidi Publ. Ltd. Bikaner.
Fundamentals of Ecology.	Odum, E.P.	W.B. Saunders Co. USA, 574p
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# P P Savani University

## 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
<ol style="list-style-type: none"><li>1. During examination time having in possession or access to<ol style="list-style-type: none"><li>a) Any paper, book, note or any other material (relevant or irrelevant).</li><li>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.</li><li>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.</li><li>d) Anything written or signs made on the body of the candidate or his/her clothes/garments, handkerchief etc which</li></ol></li></ol>	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.



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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 &amp; 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 &amp; 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 &amp; 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 8<sup>th</sup> 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.

## ACADEMIC CALENDER 2020-21

### P. P. SAVANI SCHOOL OF SCIENCES

Sr	Event	Date	Days
JUNE, 2020			
1	Ramzan - Eid (Eid-ul-fitra)	06-Jun	Saturday
2	International Yoga Day celebration	21-Jun	Thursday
JULY 2020			
1	Start of the Semester & Commencement of classes	1-July	Wednesday
AUGUST 2020			
1	Bakri Eid (Eid-al-adha)	1-July	Saturday
2	Raksha Bandan	3-Aug	Monday
3	Janmashtami	12-Aug	Wednesday
4	Independence Day celebration	15-Aug	Saturday
5	Samvatsari (Chaitiithi paksa)	22-Aug	Saturday
6	Muharram	20-Aug	Thursday
SEPTEMBER 2020			
1	Ganesh Visarjan	1 Sept	Tuesday
2	Start of the Semester 1	29-Sept	Tuesday
OCTOBER 2020			
1	Mahatma Gandhi Jayanti	02-Oct	Friday
2	FDP	05-11 Oct	1 Week
3	CE Examination sem 3 & 5	12 to 28-Oct	2 weeks
4	Dussehra	25-Oct	Sunday
5	Khelaiya		
NOVEMBER 2020			
1	Diwali Break	12-Nov to 25 Nov	2 weeks
2	Diwali	14 Nov	Saturday
3	Vikram Samvant New year	16 Nov	Monday
4	Bhai Bhij	16 Nov	Monday
5	CE Examination Sem 1 (T+P)	23 Nov to 30 Nov	1 Week
DECEMBER 2020			
1	CE (B.Sc Sem 1 & M.Sc sem 1)	1 Dec to 14 Dec	2 weeks
	ESE (B.Sc Sem 3 and 5 & M.Sc sem 3)	1-Dec to 22 Dec	3 Weeks
2	Christmas	25-Dec	Wednesday
<b>2021</b>			
JANUARY 2021			
1	Start of the Semester & Commencement of classes	04-Jan	Monday
3	Makarsakranti	14-Jan	Thursday
3	Republic day	26-Jan	Tuesday
4	ESE (B.Sc Sem 1 & M.Sc sem 1)	25 Jan to 11 Feb	2 weeks
FEBRUARY 2021			
	ESE (B.Sc Sem 1 & M.Sc sem 1)	25 Jan to 11 Feb	2 weeks
1	Sports day	08-09 Feb	Monday – Tuesday
2	Kalagoonj	12-13 Feb	Friday-Saturday
3	Mahashivratri	21 Feb	Sunday
4	Internal Exam (CE) for (B.Sc Sem 4 and 6 & M.Sc sem 4)	24 Feb to 11 Mar	
MARCH 2021			
1	Mahashivratri	11 March	Thursday
2	Dhuleti celebration	27 March	Saturday



3	Dhuleti	29-Mar	Monday
APRIL 2021			
1	CE (B.Sc Sem 2 & M.Sc sem 2)	3 <sup>rd</sup> April to 21 May	2 weeks
2	ESE (B.Sc Sem 4 and 6 & M.Sc sem 4)	3 <sup>rd</sup> Apr to 21 May	2 weeks
3	Ramnavmi	21-Apr	Wednesday
4	Cheti Chand	14 April	Wednesday
MAY 2021			
1	Ramzan	11 May	Tuesday
JUNE 2021			
1	ESE (B.Sc Sem 2 & M.Sc sem 2)	1 June 30 June	2 weeks
2	Start of the Semester & Commencement of classes for Sem 5	28 June	Monday
July 2021			
1	Start of the Semester & Commencement of classes for Sem 3 and M.Sc sem 3	1 July 2021	Thursday

**Abstract: Calculated working Days**

### July 2020 – Dec 2020

<b>Month</b>	<b>Working days</b>	<b>Holidays</b>	<b>Total</b>
July	25	6	31
August	18	13	31
September	23	7	30
October	23	8	31
November	14	16	30
<b>Total</b>	<b>103</b>	<b>50</b>	<b>153</b>

### Jan 2021 – May 2021

<b>Month</b>	<b>Working days</b>	<b>Holidays</b>	<b>Total</b>
January	22	9	31
February	21	7	28
March	22	9	31
April	23	7	30
May	4	0	4
<b>Total</b>	<b>92</b>	<b>32</b>	<b>124</b>