P P SAVANI

UNIVERSITY

SCHOOL OF SCIENCES

STUDENT HANDBOOK 2018-19

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. 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, 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."

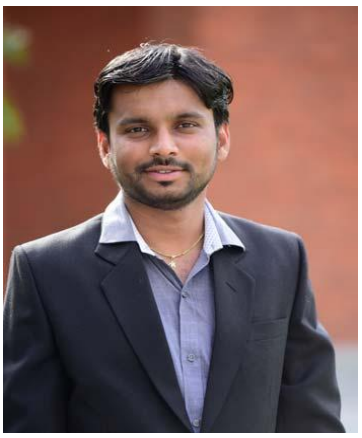
Dr. Hiren Patel (Ph.D)
I/C Principal

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.

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.

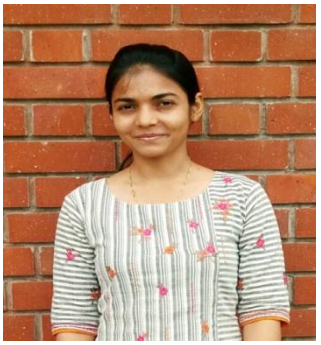
He has published research papers in National as well as International journals. He submitted 10 nucleotide DNA sequence in NCBI. He has attended many National & International conferences, workshops and trainings. His area of interest lies in Plant Biotechnology, Microbial Molecular Biology and Environmental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

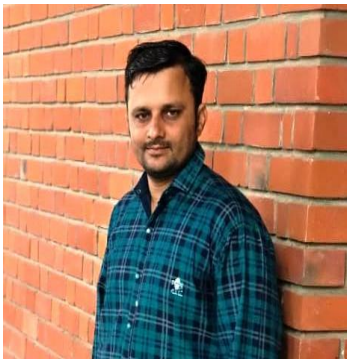
His research interest in the field of Surface and Colloidal Science. He has published 9 research articles in reputed International Journals with the collaboration of abroad and Indian professors/scientists. He has attended/presented his research work in several National/ International conferences. He 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.

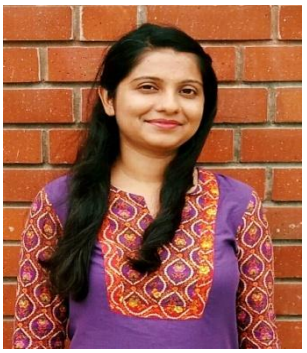
She is an avid reader of both fictional and non fictional books.

"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.



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.

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 Lily & 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.

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@ppsu.ac.in	MK
7.	Ms. Dipali Kathiriya	Mo.No.: 07405733017 Email Id: dipali.kathiriya@ppsu.ac.in	DK
8.	Dr. Bharat Solanki	Mo.No.: 09725900396 Email Id: bharat.solanki@ppsu.ac.in	BS
9.	Ms. Parini Surti	Mo.No.: 09033687881 Email Id: parini.surti@ppsu.ac.in	PS
10.	Dr. Vishal Singh Negi	Mo.No.: 8800309459 Email Id: vishal.negi@ppsu.ac.in	VN
11.	Dr. Archana Negi	Mo.No.: 6355460976 Email Id: archana.negi@ppsu.ac.in	AN

CO-ORDINATORS OF VARIOUS COMMITTEES (2018-19)

Sr. No.	Committees	Name of the member					
1.	Class Coordinator	Sem I BT+MB	Sem I ES+ Chem	Sem III BT	Sem III MB	Sem III ES	Sem V BT
		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.

Level 1	• Student -> Class Representative (Student)
Level -2	• Class Representative -> General Secretary (GS)
Level-3	• General Secretary -> Respective Committee
Level -4	• Respective Committee -> Class coordinator
Level -5	• Class coordinator -> Head of School

ACADEMIC CALENDER 2018-19

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

Abstract:

June – Dec 2018

Month	Working days	Holidays	Total	Celebration	Holidays
June	10	1	11	21st June International Yoga Day	
July	25	6	31		
August	24	7	31	15th Aug Independence Day 31st Aug Janmashtami	Bakar Eid, Rakshbandhan
September	22	8	30		Janmashtami, Ganesh Chaturthi and Moharam
October	25	6	31	17th Oct Navratri	Mahatma Gandhi Jayanti, Dashera
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	24th Christmas	Christmas
January	24	7	31	12th Jan Kite Flying 26th Republic day 7th or 21st 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**		

TEACHING AND EXAMINATION SCHEME

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
NH10, Near Biltech Company, Village: Dhamdod, Kosamba, Ta: Mangrol, Dist: Surat – 394125
Mo.No: 09879608000 · Email: info@ppsu.ac.in· Website: www.ppsu.ac.in

P P SAVANI UNIVERSITY

SCHOOL OF SCIENCES

TEACHING & EXAMINATION SCHEME FOR FIRST YEAR B.SC. (H.) CHEMISTRY AND ENVIRONMENT

Sem	Course Code		Course Title	Offered by	Teaching Scheme						WORKLOAD (HOURS)				Examination Scheme						
					Contact Hours				Credit	No of Div	Theory	Practical	Tutorial	Total	Theory		Practical		Tutorial		Total
					Theory	Practical	Tutorial	Total			Internal	Internal	Internal		CE	ESE	CE	ESE	CE	ESE	
1	SSES1070		Environment Studies	ES	2	0	0	2	2	1	2	0	0	2	40	60	0	0	0	0	100
	SSES1080		Water and Water Resources	ES	2	0	0	2	2	1	2	0	0	2	40	60	0	0	0	0	100
	SSES1090		Practical(ES/Water and water resources)	ES	0	4	0	4	2	2	0	8	0	8	0	0	40	60	0	0	100
	SSCH1010		Inorganic Chemistry	CH	2	0	0	2	2	1	2	0	0	2	40	60	0	0	0	0	100
	SSCH1020		Physical Chemistry-I	CH	2	0	0	2	2	1	2	0	0	2	40	60	0	0	0	0	100
	SSCH1030		Chemistry practical	CH	0	4	0	4	2	2	0	8	0	8	0	0	40	60	0	0	100
	SSMB1010	For B group	Introduction to Microbiology-I	MB	2	0	0	2	2	1	2	0	0	2	40	60	0	0	0	0	100
	SSMB1020		Introduction to Microbiology-II	MB	2	0	0	2	2	1	2	0	0	2	40	60	0	0	0	0	100
	SSMB1030		Microbiology Practical	MB	0	4	0	4	2	2	0	8	0	8	0	0	40	60	0	0	100
	SEPD1010		Academic English & Technical Writing	SEPD	2	2	0	4	3	2	4	4	0	8	0	0	40	60	0	0	100
	SSCH1040	For A group	Physics I	SE	2	2	0	4	3	1	2	6	0	8	40	60	40	60	0	0	200
	SSCH1050		Mathematics I	SE	2	0	1	3	3	1	2	0	2	4	40	60	0	0	40	60	200
								28	**21**	**14**				**44**							**1400**
2	SSES1100		Ecology and Ecosysytem-I	ES	2	0	0	2	2	1	2	0	0	2	40	60	0	0	0	0	100
	SSES1110		Physical Environment	ES	2	0	0	2	2	1	2	0	0	2	40	60	0	0	0	0	100
	SSES1120		Ecology and physical Environment Practical	ES	0	4	0	4	2	2	0	8	0	8	0	0	40	60	0	0	100
	SSCH1060		Organic Chemistry	CH	2	0	0	2	2	1	2	0	0	2	40	60	0	0	0	0	100
	SSCH1070		Physical Chemistry-II	CH	2	0	0	2	2	1	2	0	0	2	40	60	0	0	0	0	100
	SSCH1080		organic and physical chemistry Practical	CH	0	4	0	4	2	2	0	8	0	8	0	0	40	60	0	0	100
	SSBT1040	For B group	Cell Biology-I	BT	2	0	0	2	2	1	2	0	0	2	40	60	0	0	0	0	100
	SSBT1050		Cell Biology-II	BT	2	0	0	2	2	1	2	0	0	2	40	60	0	0	0	0	100
	SSBT1060		Practical	BT	0	4	0	4	2	2	0	8	0	8	0	0	40	60	0	0	100
	SEPD1020		Communication Skills	SEPD	2	2	0	4	3	2	4	4	0	8	0	0	40	60	0	0	100
	SSCH1090	For A group	Physics II	SE	2	2	0	4	3	1	2	6	0	8	40	60	40	60	0	0	200
	SSCH1100		Mathematics II	SE	2	0	1	3	3	1	2	0	2	4	40	60	0	0	40	60	200
								28	**21**	**14**				**44**							**1400**

Syllabus

Semester-1

P P Savani University
School of Sciences

Department of Environment Science

Course Name: **Environment Studies**
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	
SSES1070	2	0	0	2	2	40	60	0	0	0	0	100
SSES1080	2	0	0	2	2	40	60	0	0	0	0	100
SSES1090	0	4	0	4	2	0	0	40	60	0	0	100

CE: Continuous Evaluation, ESE: End Semester Exam

Objective of the Course:

- To provide basic knowledge of environment fundamentals, enriching students to understand the role of Environment in the field of science.
- To make them aware of the existing scenario of the environment and efforts needed to preserve it further.

Course Content:

Course code:- **SSES1070**			
Course Name:- **Environment Studies**			
Units	**Content**	**Hours(h)**	**Weightage (%)**
1.	**Multidisciplinary nature of environmental studies**	**02**	**10**
2.	**Natural Resources**	**08**	**30**
3.	**Biodiversity and its conservation**	**10**	**35**
4.	**Social Issues and the Environment**	**10**	**25**
Course code:- **SSES1070**			
Course Name:- **Environment Studies**			
1	**Multidisciplinary nature of environmental studies** Definition, scope and importance, Need for public awareness.	**2**	**10**
2	**Natural Resources.** Renewable and non-renewable resources: Natural resources and associated problems. a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people. b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems. c) Mineral resources: Use and exploitation, environmental effects of extracting	**8**	**30**

	and using mineral resources, case studies. d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. e) Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. Case studies. f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. • Role of an individual in conservation of natural resources • Equitable use of resources for sustainable lifestyles.		
3	**Biodiversity and its conservation** Introduction – Definition: genetic, species and ecosystem diversity. • Bio geographical classification of India • Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values • Biodiversity at global, National and local levels. • India as a mega-diversity nation • Hot-sports of biodiversity. • Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. • Endangered and endemic species of India • Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.	**10**	**35**
4	**Social Issues and the Environment** From Unsustainable to Sustainable development • Urban problems related to energy • Water conservation, rain water harvesting, watershed management • Resettlement and rehabilitation of people; its problems and concerns. Case Studies • Environmental ethics: Issues and possible solutions. • Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies. • Wasteland reclamation. • Consumerism and waste products. • Environment Protection Act. • Air (Prevention and Control of Pollution) Act. • Water (Prevention and control of Pollution) Act • Wildlife Protection Act • Forest Conservation Act • Issues involved in enforcement of environmental legislation. • Public awareness.	**10**	**25**

Course Name: **WATER AND WATER RESOURCES**
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	
SSES1070	2	0	0	2	2	40	60	0	0	0	0	100
SSES1080	2	0	0	2	2	40	60	0	0	0	0	100
SSES1090	0	4	0	4	2	0	0	40	60	0	0	100

CE: Continuous Evaluation, ESE: End Semester Exam

Objective of the Course:

- It will highlight the problems associated with water shortages in India and familiarizes students with case studies on international and national conflicts on water.
- To familiarize with the various characteristics of water and with the sources of water.

Course Content:

Course code:- **SSES1080**			
Course Name:- **WATER AND WATER RESOURCES**			
Units	**Content**	**Hours(h)**	**Weightage (%)**
1.	**Introduction** Sources and types of water; hydrological cycle; precipitation, runoff, infiltration, evaporation, evapo-transpiration; classification of water resources (oceans, rivers, lakes and wetlands).	4	15
2.	**Properties of water** Physical: temperature, colour, odor, total dissolved solids and total suspended solids; Chemical: major inorganic and organic constituents, dissolved gases, DO, COD, BOD, acidity and alkalinity, electrical conductivity, sodium adsorption ratio; Biological: phytoplankton, phytobenthos, zooplankton, macro-invertebrates and microbes.	8	25
3.	**Surface and subsurface water** Introduction to surface and ground water; surface and ground water pollution; water table; vertical distribution of water; formation and properties of aquifers; techniques for ground water recharge; river structure and patterns; watershed and drainage basins; importance of watershed and watershed management; rain water harvesting in urban settings.	12	35
4.	**Wetlands and their management** Definition of a wetland; types of wetlands (fresh water and marine); ecological significance of wetlands; threats to wetlands; wetland conservation and management; Ramsar Convention, 1971; major wetlands of India.	6	20

List of Practical/Tutorial:

Course code:- **SSES1090**		
Course Name:- **Environment and Water Resources Practical**		
Sr.No	**Name of Practical/Tutorial**	**Hours**
1.	Collection of samples- air, water and soil	10
2.	Determination of pH from soil and water samples	10
3.	Estimation of D.O. in water	10
4.	Determination of conductivity from soil samples	10
5.	Case Studies	10
	Total	**50**

Reference/textbooks Book:

Title	**Author/s**	**Publication**
Water Management in India	Bansil, P.C. 2004	Concept Publishing Company, India
Water Resources Management VII	Water Resources Management VII	WIT 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. To be able to understand the potential ways of water pollution.
2. To be able to identify the characteristics of water
1. To be able to learn the practices of water conservation and watershed management.

P PSavani University
School of Sciences

Department of chemistry

Course Name:**Inorganic & Physical**
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	
SSCE1010	2	0	0	2	2	40	60	0	0	0	0	100
SSCE1020	2	0	0	2	2	40	60	0	0	0	0	100
SSCE1030	0	4	0	4	2	0	0	40	60	0	0	100

CE: Continuous Evaluation, ESE: End Semester Exam

Objective of the Course:

- The present study enhancesstudents'knowledge about Inorganic and Physical chemistry to understand their rolein the field of sciences.
- To inculcate habits of scientific reasoning to do the task rationally.

Course Content:

Course code:-SSCE1010			
Course Name:-**Inorganic Chemistry – I**			
Units	**Content**	**Hours(h)**	**Weightage(%)**
1.	**Atomic structure-Classical Mechanics** 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, arrangement of electrons in orbits, Zeeman effect.	08	27
2.	**Periodic Properties of Elements** Classification of elements, periodic table,Mendeleev's periodic table, significance and its limitation, Modern periodic table, the long form of periodic table, Electronic configurations of elements and periodic table,s, p, d, f block elements, Detailed discussion of the following properties of the elements, with reference to s and p-block. (a) Effective nuclear charge, shielding or screening effect, Slater rules, variation of effectivenuclear charge in periodic table. (b) atomic radius, metallic radius, ionic radius, crystal radii, van der Waals, Covalent radii (c) Ionization enthalpy, Successive ionization enthalpies and factors affecting ionization energy. Applications of ionization enthalpy. (d) Electron gain enthalpy, trends of electron gain enthalpy.	12	40

	(e) Electronegativity, Pauling's/ Mulliken's/ Allred Rachow's, electronegativity scales, Variation of electronegativity with bond order, partial charge, hybridization, group electronegativity.		
3.	**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	10	33
Course code:-SSCE1020			
Course Name:-**Physical Chemistry – I**			
1	**Solution** Solute, Solvent, Solution, Methods of expressing concentration terms for solution, Examples of solution preparation, Titration, Types of titrations, Measuring the endpoint of a titration via different methods, Difference between endpoint and equivalence point, Theory of acid–base indicators; selection of indicators and their limitations.	6	20
2	**Liquid state** Types of intermolecular forces with suitable examples (Dipole-Dipole, London forces, H-bonding), Definition, unit, effect of temperature and characterization for following physical properties: 1) Vapor pressure, 2) Surface tension, 3) Viscosity, 4) Refractive index, 5) Optical Activity.	8	27
3	**Colloids** Introduction, Classification of colloids, Preparation of colloidal solutions via condensation and dispersion methods, Dialysis, Ultra-filtration, Properties of colloidal solutions, Coagulation or flocculation of colloids, Stability of colloids by different methods, Gold number, Zeta potential, Application of colloids.	8	27
4	**Acids and Bases** Basic properties of acids and bases, Acid-base concepts, Derive equation for relative strength of strong acids and bases, Calculate the relative strength of weak acids and bases, pH, pH scale, measurements of pH by pH paper, indicators and pH meter, 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.	8	26

List of Practical/Tutorial:

Course code:-SSCE1030		
Course Name:-**Inorganic & Physical Chemistry Practical-I**		
Sr. No	**Name of Practical/Tutorial**	**Hours**
1.	Introduction to laboratory,safety rules during practical, knowledge about different	**6**

	sign and symbols regarding hazardous materials,calibration and use of apparatus/common glassware and their uses.volumetric titrations, quantitative analysis, quantitative analysis, precautions during experiments and titrations.	
2.	Prepare given concentration solutions and standardized them.	**6**
3.	Estimation of free alkali present in different soaps/detergents	**6**
4.	Estimation of oxalic acid and sodium oxalate in a given mixture.	**6**
5.	Estimation of ferrous ions using potassium dichromate by internal indicator method	**6**
6.	Prepare 0.1N NaOH solution and standardize it by given oxalic acid solution.	**6**
7.	Surface tension measurements of different solvents by stalagnometer	**6**
8.	Viscosity of different solvents by Ostwald's viscometer.	**6**
9.	pH metric titration of (i) strong acid vs. strong base	**6**
10.	Determine the precipitation values for arsenious sulphide sol.	**6**
	Total (Chemistry)	

Reference/textbooks Book:

Title	**Author/s**	**Publication**
Concise Inorganic Chemistry	J.D. Lee	Wiley India
Engineering Chemistry (16th 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
Advanced Practical Physical Chemistry	J. B. Yadav	Krishna Prakashan Media
Vogel's Qualitative Inorganic Analysis 7th Edition	G. Svehla, B. Sivasankar	Pearson

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 fundamental knowledgeabout chemical sciences.
2. Able to have sound knowledge related to solution chemistry.
3. Able to apply the knowledge of liquid,colloidal and acids, baseschemistryon different systems.

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, Fimbrae, 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 an 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	Peleczar	Tata McGraw-Hill
General Microbiology	StanierRY, Ingraham JL, Wheelis ML, and Painter PR	5th edition. McMillan (2005)
Experiments in Microbiology, Plant Pathology and Biotechnology	Aneja	New Age Publisher
Microbiology Introduction	TortoraGerad	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 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 inthe 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** • General English Vs Academic English • Academic Vocabulary • Grammar for Academic Purposes	04	10 %
2.	**Academic Reading** • Introduction to Reading • Types of Reading • Techniques of Reading	06	20 %
3.	**Academic Listening** • Introduction to Listening • Types of Listening • Techniques of Listening	06	20 %
4.	**Academic Speaking** • Introduction to Speech and Its importance • Phonetics and Transcription to effective pronunciation • Speaking in various contexts	06	20 %
5.	**Technical Writing** • Understanding clauses and Syntax • Cohesion and Coherence/ Building Paragraphs • Flow/ structure of Writing • Punctuations • Application/ Letter Writing	08	30 %

	• Review/ Report Writing • E-mail etiquettes		
Section II – Practical			
Module	Content	Hours	Weightage
1.	**Introduction to Academic English** • Ice Breakers • Role Plays • Grammar and Vocabulary Activities	04	15 %
2.	**Academic Reading (Computer Assisted)** • Reading for summarizing/ paraphrasing • Critical Reading • Reading for presentation • Utilizing web resources	04	15 %
3.	**Academic Listening (Computer Assisted)** • Listening for Note Taking/ Note making • Critical Listening • Comprehensive Listening	06	20 %
4.	**Academic Speaking** • Speaking and pronunciation activities • Extempore and Impromptu speech/ presentation	08	25 %
5.	**Technical Writing (Computer Assisted)** • 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.

P PSavani University
School of Sciences

Department of chemistry

Course Name:Physics
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	
SSCH1040	2	0	0	2	2	40	60	0	0	0	0	100
	0	2	0	2	1	0	0	40	60	0	0	100

CE: Continuous Evaluation, ESE: End Semester Exam

Objective of the Course:

- This course will provide basic theoretical and practical understanding of physics and its application in real world.

Course Content:

Course code:-SSCH1040			
Course Name:- **Physics– I**			
Units	**Content**	**Hours(h)**	**Weightage(%)**
1.	**General Physics** Definition, unit, resolution of forces, Newton's law of motion, types of motion, force of gravity and center of gravity, reaction forces, equilibrium, determination of equilibrium of body, work, power, energy, torque. Force of friction, laws of static and dynamic friction, limits of friction, friction a necessity and evil.	07	20
2.	**LASER & FIBER OPTICS** Introduction, Characteristics of laser radiation, Spontaneous and stimulated emission, Working of LASER with basic idea about Population Inversion, Pumping mechanism, Optical Resonators, Nd:YAG LASER , Applications of LASER. Introduction of Optical Fiber Advantages of Optical Fiber, Total Internal Reflection, Numerical Aperture and Acceptance angle, Modes of Propagation, Types of Optical Fiber, Applications of optical fiber.	08	25%
3.	**Properties of matter** Stress and strain, Hooke's law, factors affecting elasticity, three	07	25%

	types of elasticity, equivalence of a shear to a compression and an extension at right angles to each other, shearing stress equivalence to an equal linear tensile stress and an equal linear compressive stress at right angles to each other, deformation of a cube-bulk modulus, modulus of rigidity, Young's modulus, relation connecting elastic constants, Poisson's ratio. Torsional pendulum, determination of the coefficient of rigidity η.		
4.	**Electrostatics** The electric field, electric field lines, the electric field due to a point charge, Gauss' law and Coulomb's law, Electric current, current density, resistance and resistivity, Ohm's law, RC circuits. Introduction to Semiconductors, intrinsic and extrinsic Semiconductors, Types of Diodes,Advantages of Semiconductor devices, Transistors, Types of transistor, Bipolar Junction Transistor, junction field effect transistor	08	30%

List of Practical/Tutorial:

Course Name:-**Physics Practical-I**		
Sr. No	**Name of Practical/Tutorial**	**Hours**
1.	**Error analysis**	**2**
2.	**Planck's constant**	**4**
3.	**Numerical aperture and Acceptance angle of an optical fiber**	**2**
4.	**Hall effect**	**4**
5.	**Hysteresis loop**	**2**
6.	**Young's Modulus**	**4**
7.	**LED I-V Characteristic**	**4**
8.	**Capacitor and Resister in series and parallel.**	**4**
9.	**RLC Circuit**	**4**
	Total (Physics)	**30**

Text Book:

Title	**Author/s**	**Publication**
Engineering Physics	B.K.Pandey& S. Chaturvedi	CENGAGE Learning

Title	**Author/s**	**Publication**
Engineering Physics	B.K.Pandey& S. Chaturvedi	CENGAGE Learning
Electronic Principles	Malvino, A.P	Tata McGraw Hill, 1999.
Fundamentals of Physics	Halliday, Resnick and Walker	Wiley
Principal of Electronics	Mehta and Mehta	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:

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

Basic understanding of physics which will prepare the students for an intensive study of advanced topics at a later stage.

P PSavani University
School of Sciences

Department of Chemistry

CourseName:Mathematics
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	
SSCH1050	2	0	1	3	3	40	60	0	0	40	60	200

CE: Continuous Evaluation, ESE: End Semester Exam

Objective of the Course:

- To develop understanding of fundamental mathematical concepts.
- To develophabits of providing solutionsthat include appropriate justification for their reasoning.

Course Content:

Course code:-SSCH1050			
Course Name:-**Mathematics-I**			
Units	**Content**	**Hours(h)**	**Weightage(%)**
1.	Function :Domain,Range,One-one,ontofunction,compositionoffunctions, Complexnumber:Algebraofcomplexnumber. Quadraticequationanditssolution.	06	20
2.	Exponential&Logarithmicfunction:Elementaryproperties. Trigonometricfunctions:sine,cosine,tan,cot,cosec,secandtheirinversefunction.Formulae:cos(A±B),sin(A±B),tan(A±B),sin(2θ),cos(2θ),tan(2θ).	08	26
3.	Determinant:2×2,3×3order,Expansion,elementaryproperties,Matrices:2×2,3×3order, Algebraofmatrices(Addition,Scalarproduct,productoftwomatrices)	08	27
4.	Vectoralgebra:VectorspaceR_2andR_3 Operation:Addition,scalarmultiplicationand vectormultiplication,magnitudeofvector,Innerproduct,Box/Tripleproduct,angle betweentwovectors.	08	27

List of Tutorial:

Course Name:-**Mathematics Practical-I**		
Sr. No	**Name of Practical/Tutorial**	**Hours**
1.	Function 1	3
2.	Complex Number and Quadratic Equations	3
3.	Exponential and Logarithmic Functions	3
4.	Trigonometric functions 1	3
5.	Trigonometric functions 2	3
6.	Determinant 1	3
7.	Determinant 2	3
8.	Matrices	3
9.	Algebra of Vector spaces R2 and R3	3
10.	Inner Product	3
	Total (Chemistry)	**30**

Reference/textbooksBook:

Title	Author/s	Publication
A First Course in Mathematical Analysis	D Somasundaram and B Choudhary	Narosa Publishing House
Functions of a Complex Variable	J. N. Sharma	Krishna Prakashan
Plane trigonometry, Part I and II	S.L.Loney	McMillan & Co. London.
Text book of Matrices	Shantinarayan	S.Chand and Co.
Elementary Linear Algebra (Application Version)	Anton and Rorres	Wiley India Edition

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.

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 basic of Analysis and Linear Algebra.
2. Able to apply the knowledge of functions, Determinant to different areas of Mathematics.

Semester-2

P P Savani University
School of Sciences

Department of Environment Science

Course Name: **ECOLOGY AND ECOSYSTEMS 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	
SSES1100	2	0	0	2	2	40	60	0	0	0	0	100
SSES1110	2	0	0	2	2	40	60	0	0	0	0	100
SSES1120	0	4	0	4	2	0	0	40	60	0	0	100

CE: Continuous Evaluation, ESE: End Semester Exam

Objective of the Course:

- It will make them aware of the real life interaction of components of the ecosystem.
- To make them learn of the various factors involved in the development of the ecosystem.

Course Content:

Course code:- **SSES1100**

Course Name:- **ECOLOGY AND ECOSYSTEMS I**

Units	Content	Hours(h)	Weightage (%)
1	**Introduction** Basic concepts and definitions: ecology, landscape, habitat, ecozones, biosphere, ecosystems, ecosystem stability, resistance and resilience; autecology; synecology; major terrestrial biomes.	5	15
2	**Ecology of individuals** Ecological amplitude; Liebig's Law of the Minimum; Shelford's Law of Tolerance; phenotypic plasticity; ecotypes; ecoclines; acclimation; ecological niche; types of niche: Eltonian niche, Hutchinsonian niche, fundamental niche, realized niche; niche breadth; niche partitioning; niche differentiation; thermoregulation; strategies of adaptation in plants and animals.	10	20
3	**Ecology of populations** Concept of population and meta-population; r- and K-selection; characteristics of population: density, dispersion, natality, mortality, life tables, survivorship curves, age structure; population growth: geometric, exponential, logistic, density-dependent; limits to	6	30

	population growth		
4	**Ecology of communities** Discrete versus continuum community view; community structure and organization: physiognomy, sociability, species associations, periodicity, biomass, stability, keystone species, ecotone and edge effect; species interactions: mutualism, symbiotic relationships, commensalism, amensalism, proto cooperation, predation, competition, parasitism, mimicry, herbivory; ecological succession: primary and secondary successions, models and types of successions, climax community concepts, examples of succession.	9	35

Reference/textbooks Book:

Title	**Author/s**	**Publication**
Fundamentals of Ecology	Odum, E.P. 1971	W.B. Sounders.
Ecology, Environment and Resource Conservation	Singh, J.S., Singh, S.P. & Gupta, S.R. 2006	Anamaya Publications.
The Ecology of Plants	Gurevitch, J., Scheiner, S. M., & Fox, G. A. 2002	Sinauer associates incorporated.

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…

- To be able to understand the integrities of the ecosystem.
- To be able to identify with problems associated with the ecosystem.

P P Savani University
School of Sciences

Department of Environment Science

Course Name: **- PHYSICAL ENVIRONMENT 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	
SSES1100	2	0	0	2	2	40	60	0	0	0	0	100
SSES1110	2	0	0	2	2	40	60	0	0	0	0	100
SSES1120	0	4	0	4	2	0	0	40	60	0	0	100

CE: Continuous Evaluation, ESE: End Semester Exam

Objective of the Course:

- It will introduce to the students the basic the subject of physical environment.
- It will improve their understanding about components of the atmosphere.

Course Content:

Course code:- **SSES1110**			
Course Name:- **PHYSICAL ENVIRONMENT I**			
Units	**Content**	**Hours(h)**	**Weightage (%)**
1	**Unit I: Introduction to Environment** • Concept and types of environment: Physical, Biological and Cultural - Environment as perceived by different sciences. • Earth & the Solar System - Movements of the earth, Kepler's laws of motion, Newton' law of gravitation, moment of inertia, Coriolis force. Earth's magnetic field- Magnetic field intensity, magnetic lines of force, magnetic induction. magnetic field around a current carrying conductor, Biot-savart's law, Tangent Galvanometer • Solar energy and heat balance • Controls over heating and cooling-land and water differences • Heating processes-radiation, green house effect, conduction, compression, condensation • Cooling processes-evaporation, expansion, advection, temperature inversions	15	40
2	**Atmosphere** • Composition of the atmosphere • Air-composition, density, thermal structure and stratification • Factors affecting global distribution of insolation • Causes and effects of: insolation; pressure & winds; monsoon system; humidity phenomena; air masses; precipitation; types of clouds.	10	35

3	**Marine & Submarine Environment** • Coastal Zone Classification. Characteristic physical features of coastal areas • Ocean floor deposits and coral reefs. • Ocean water-temperature, salinity, circulation	05	25

List of Practical/Tutorial:

Course code:- **SSES1120**		
Course Name:- **ECOLOGY AND PHYSICAL ENVIRONMENT PRACTICAL**		
Sr.No	**Name of Tutorial**	**Hours**
1.	Tutorial 1	10
2.	Tutorial 2	10
3.	Tutorial 3	10
4.	Tutorial 4	10
5.	Tutorial 5	10
6.	Tutorial 6	10
	Total	**60**

Reference/textbooks Book:

Title	**Author/s**	**Publication**
Physical Geography	Savindra Singh S	Prayag Pustak Bhavan ,Alhabad
Geology, Environment And Society	Valdiya K.S	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. To be able to understand the factors contributing the green house effect.
2. To be able to understand the formation of clouds and the process of precipitation.

P PSavani University
School of Sciences

Department of Chemistry

Course Name:**Organic& Physical Chemistry**
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	
SSCE1040	2	0	0	2	2	40	60	0	0	0	0	100
SSCE1051	2	0	0	2	2	40	60	0	0	0	0	100
SSCE1060	0	4	0	4	2	0	0	40	60	0	0	100

CE: Continuous Evaluation, ESE: End Semester Exam

Objective of the Course:

- The present studysupports undergraduates to acquire the knowledge about thefundamental of organic chemistry.
- An understanding of physical chemistry is an important area for students to complete a major or minor study in chemistry, and it lies on the borderline with engineering.

- **Course Content:**

Course code:-SSCE1040			
Course Name:-**Organic Chemistry – I**			
Units	**Content**	**Hours(h)**	**Weightage(%)**
1.	**Aliphatic hydrocarbons** Definitions (Bond distances, Bond angles, Torsion angle, Isomers) (i) Alkanes: nomenclature, sources, methods of formation, Physical properties and chemical reactions. (ii) Alkenes: Nomenclature, method of preparation, Physical properties, Reactions of alkenes. (iii) Dienes: nomenclature, classification of dienes methods of formation of Butadiene chemical reactions 1,2 and 1,4 additions, polymerization, Diels-Alder Reaction. (iv) Alkynes: nomenclature, Isomerism, methods of formation, Physical properties, chemical reactions, electrophilic and nucleophilic addition reactions of acetylene.	8	27
2.	**Aromatic hydrocarbons** Introduction, Nomenclature of aromatic compounds, Source of aromatic compound, Arenes, Monocyclic Arens, Aromaticity, Modern Theory of Aromaticity, Hückel's rule, Nomenclature, Method of preparation of benzene, Physical properties, Electrophilic aromatic substitution:halogenation, nitration, sulphonation and Friedel-Craft's alkylation/acylation with	8	27

	theirmechanism. Aromatic addition reaction, Applications of benzene.		
3.	**Fundamentals of Organic Chemistry** Introduction, Homolytic and Heterolytic fission with suitable examples, Electronic Displacements, Inductive, Electromeric, Resonance and mesomeric effects, hyperconjugation and their applications, Dipole moment, types of arrow, Electrophiles and Nucleophiles, Leaving groups,Basic idea about Carbocations, Carbanions, Free radicals and Carbenes and their stability, Types of organic reactions and their mechanism: Substitution reactions Elimination and, Addition, Rearrangement reactions, Beckmann rearrangement, Aldol condensation.	6	20
4.	**Basic of Stereochemistry** Historyand introductionsof stereochemistry **Molecular Projections**:Fischer Projections, Characteristics and Limitations, Sawhorse Projections, Newman Projections, Interconversions of Fischer-Sawhorse-Newman Projections. **Geometrical Isomerism**: cis–trans and, syn-anti isomerism E/Z notations with C.I.P rules. **Optical Isomerism:** Optical Activity, Specific Rotation, Chirality/Asymmetry, Enantiomers, Distereoisomers, meso structures, Racemic mixture and resolution. Relative and absolute configuration, Comparison between D, L and R, S Nomenclature.	8	26
Course code:-SSCE1051			
Course Name:-**Physical Chemistry – II**			
1	**Solutions and Colligative Properties** Dilute solutions; lowering of vapour pressure, Raoult'slaw, Real solution, elevation of boiling point, freezing pointdepression, Osmotic pressure, Isotonic solutions, Reverse Osmosis, colligative properties of electrolytes, Relation between van'thoff factor and degree of dissociation, Henry's Laws and their applications.	6	20
2	**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, Isothermal reversible expansion and reversible expansion work of an ideal gas, Internal energy, Sign conversations and units, First law of thermodynamics, enthalpy of system, Relation between $\triangle H$ and $\triangle E$, Heat capacity, Specific and molar heat capacities, Concept of entropy, Entropy, Statement of the second law of thermodynamics, Statement of the third law, Units of entropy, Zeroth law of thermodynamics.	8	27
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, Collision theory of reaction rates, Discuss postulates of the collision theory, Effect of temperature on	8	27

	reaction rate, Limitations of the collision theory.		
4	**Adsorption** Introduction, Types of adsorption,Adsorption of gases by solids, Comparison of physical adsorption and chemisorption, Adsorption isotherms, Freundlich adsorption isotherms and its limitations, Langmuir adsorption isotherms at high & low pressure and its limitations, Applications ofadsorption, Ion–exchange adsorption, Applications of ion–exchange adsorption.	8	26

List of Practical/Tutorial:

Course code:-SSCE1060		
Course Name:-**Organic and Physical Chemistry Practical-II**		
Sr. No	**Name of Practical/Tutorial**	**Hours**
1.	Introduction to laboratory,Safety rules during practical,Calibration and use of apparatus/common glassware and their uses. precautions during experiment and titrations.	**6**
2.	Purification of organic compounds by crystallization (solvents: Water, Alcohol, Alcohol-Water)	**6**
3.	Determine melting point, boiling point, and solubility of various organic compounds.	**6**
4.	Identify hydrocarbons (aliphatic and aromatic) by chemical tests.	**6**
5.	Qualitative Analysis of Organic compounds (single component)	**6**
6.	To determine the specific optical rotation of glucose by polarimeter	**6**
7.	To determine the molar mass of an unknown solid using freezing point depression.	**6**
8.	Determination of cloud point of a surfactant in the presence of salts.	**6**
9.	To study the monomolecular reaction in the hydrolysis of methyl acetate in 0.5 N HCl at different initial concentrations.	**6**
10.	To study the adsorption of given organic acid by animal charcoal.	**6**
	Total (Chemistry)	

Reference/textbooks Book:

Title	**Author/s**	**Publication**
Advanced organic chemistry	Arun Bahl and B S Bahl	S. Chand
Stereochemistry	Ranjit S. Dhillon, Inder Pal Singh, Chinnappan Baskar	Narosa Publishing House
Essentials of Physical Chemistry	A.Bahl, B.S. Bahl and G.D. Tuli	S. Chand Publishing
Atkins' Physical Chemistry 10th Edition	Peter Atkins and Julio de Paula	Oxford University Press
Organic Chemistry 7th Edition	Robert Neilson Boyd, SaibalKanti Robert, Thornton Morrison	Pearson
Advanced Practical Physical Chemistry	J. B. Yadav	Krishna Prakashan Media
Comprehensive Practical Organic Chemistry: Qualitative Analysis	V.K. Ahluwalia, S. Dhingra	Universities 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, undergraduates will be…

1. Able to obtain fundamental knowledge of organic chemistry in the field of science.
2. Able to have sound knowledge about colligative properties.
3. Able to apply the knowledge of thermodynamics, chemical kineticsand applied in different chemical systems.
4. Developed skills in analysis and practical tasks of physical chemistry

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-acis 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.	6th Edition. John Wiley & Sons. Inc.
Cell and Molecular Biology.	De Robertis, E.D.P. and De Robertis, E.M.F. 2006.	8thedition.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 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 tothe key communication techniques, and thereby
- Improvise comprehension and expressional skills of the students requiredfor 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 Communicationwith reference to Group Dynamics,

Course Content:

Section I– Theory			
Module	Content	Hours	Weightage
1.	**Introduction to Communication Skills** • Concept and Process of Communication • Types of Communication • Principles of Effective Communication • Barriers to Communication	06	20 %
2.	**Interpersonal Organizational Communication** • 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** • 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** • Introduction to presentation and its importance • Modes, means and purposes of presentation • Defining purpose, analyzing audience and organizing the contents	06	20 %

	• Visual aids and nuances of delivery • Body language and effective presentation		
5.	**Communication and Contemporary World** • 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** • Role Plays • Communication Games and Activities	06	20 %
2.	**Interpersonal Organizational Communication** • Group Tasks • Flip Classroom Activity • Role plays • Other Relevant Activities and Games	06	20 %
3.	**Team/ Group Dynamics and Leadership** • Group Activities • Case Studies • Team Building Games	06	20 %
4.	**Presentation Skills** • Individual Presentation practicing various modes • Reading and Preparing for Presentation • Self-Peer-teacher assessment of the Presentation	06	20 %
5.	**Communication and Contemporary World** • 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=CJf34fyQv5wCFdMtpAodjjX_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 classroomdiscussions and other such academic or academic support activities.
3. Comprehend whatever they receive from Informal Interactions with the family, teachers.and friends; and from FormalCommunications taking Place in Lectures, Laboratories and the like.
4. Communicate effectively usingsuitable styles and techniques.
5. Express themselves through the modern modesof communication and to participate in the group discussions and other such academic oracademic support activities.
6. Use language effectively with referenceto communication in groups and group behavior.
7. Understand and use latest and innovative communication tools to enhance their communication efficacy.

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.

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 (Si) = Σ(Ci x Gi) / ΣCi
   Where, Ci is the number of credits of the ith course and Gi is the grade point scored by the student in the ith 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 = Σ(Ci x Si) / Σ Ci
   Where, Si is the SGPA of the ith semester and Ci 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.

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.

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
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	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.

may have relevance to the syllabus of the examination paper concerned. 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.	His/her examination result in that course will be cancelled and F grade will be awarded in that course.
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.	His/her examination result in that course will be cancelled and F grade will be awarded in that course.
4. Swallowing or attempting to swallow or destroying or attempting to destroy a note or paper or any other material.	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.
5. Impersonating any candidate or getting impersonated by any person for taking the examination.	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.
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.	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.
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.	The candidate will be awarded F Grade in all course of the semester in which he/she has appeared for examination.

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.