



P P SAVANI
UNIVERSITY
SCHOOL OF SCIENCES

STUDENT HANDBOOK
2020-21



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ABOUT THE UNIVERSITY

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

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

Ph.D. Biotechnology/Microbiology/Chemistry
M.Sc. Biotechnology/Microbiology/Chemistry, PGDMLT
B.Sc. (Honours) Biotechnology/Microbiology/Chemistry/IT/Fire and Safety/IT
NH10, Near Biltech Company, Village: Dhamdod, Kosamba, Ta: Mangrol, Dist: Surat – 394125
Mo.No: 09879608000 · Email: info@ppsua.ac.in · Website: www.ppsua.ac.in



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MESSAGE FROM THE DIRECTOR

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

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

Mr. Vallabhbhai Savani
Director



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MESSAGE FROM PROVOST

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

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

However, the hope of entering this school of Sciences is not limited to Gujarat state, but is extended to many who are interested in life sciences. Of course, students along with delegates of different states are also welcome. The education and research system of the School of Sciences has a major feature. While there are only five courses including Biotechnology, Microbiology, Chemistry, Environmental Science, Information Technology, and Fire Safety which covers various biological aspects including technology and somehow covers life environmental science, in order to comprehensively explore cutting-edge life science. Although there are many young dynamic and experienced teachers on our staff related to this field, this school chooses to open these courses for a good reason. I am honored by the overwhelming support we receive from management. They are passionate about University mission, success and continued growth for the future.

Dr. Parag Sanghani
Provost



MESSAGE FROM THE PRINCIPAL

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

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

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

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

Our Vision:

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

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

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

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



PROGRAMMES OFFERED AT UNIVERSITY

- **M.Sc. Biotechnology**
- **M.Sc. Microbiology**
- **M.Sc. Chemistry**
- **M.Sc. Computer Science**
- **M.Sc. Integrated (Biotechnology, Microbiology)**
- **PGDMLT**
- **B.Sc. (H.) Biotechnology**
- **B.Sc. (H.) Microbiology**
- **B.Sc. (H.) Environment Science**
- **B.Sc. (H.) Chemistry**
- **B.Sc. (H.) Fire and Safety**
- **B.Sc. (H.) IT**
- **Bachelor of Physiotherapy**
- **Bachelor of Interior Design**
- **Bachelor of Architecture**
- **Bachelor of Nursing**
- **Bachelor of Engineering (Mechanical, IT, Computer, Textile, Civil, Chemical)**
- **Bachelor of Commerce**
- **Bachelor of Business Administration**
- **Bachelor of Arts**

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FACULTY PROFILES

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



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

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

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Dr. Vishal Singh Negi (Ph.D.) is an Assistant Professor in the Department of Biotechnology / Microbiology, School of Sciences at the P P Savani University. He is a Ford Fellow from the United States of America. He received his Ph.D. in Molecular Biosciences and Bioengineering from the University of Hawaii, USA. After his Ph.D., Dr. Negi worked as a postdoctoral researcher in one of the leading mesothelioma research laboratories in the world (UH Cancer Center, USA). Before joining PPSU, Dr. Negi was working on epigenomics and centromere biochemistry at UH Manoa, USA. He has published his research in several high-impact factor international journals and presented his work in several international conferences as well. Dr. Negi has mentored several undergraduate and postgraduate students and has been actively serving as a reviewer in several international journals. His research interest lies in epigenomics, microbiome, biochemistry, and bioinformatics. Besides academic and research activities, Dr. Negi enjoys playing badminton, table tennis, and volleyball.



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



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



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

Dr. Archana Negi (Ph.D.) is an Assistant Professor in the Department of Biotechnology / Microbiology, School of Sciences at the P P Savani University. She obtained her Ph.D. in Molecular Biosciences and Bioengineering from the University of Hawaii, USA. Dr. Negi has worked in academics as well as in industry. She has worked in premier research institutions such as International Center for Genetic Engineering and Biotechnology, New Delhi, and



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

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



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

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

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



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



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

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

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

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



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

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



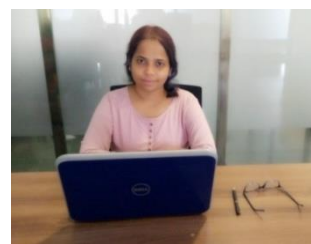
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and Dr. D. S. Kothari Post doctoral Fellowship (for postdoctoral research). She is engaged in the research field of surface, colloid and polymer science and published many research papers in reputed international journals in collaboration with several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

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



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

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



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

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

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



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





ACADEMIC RULES AND REGULATIONS

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

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

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



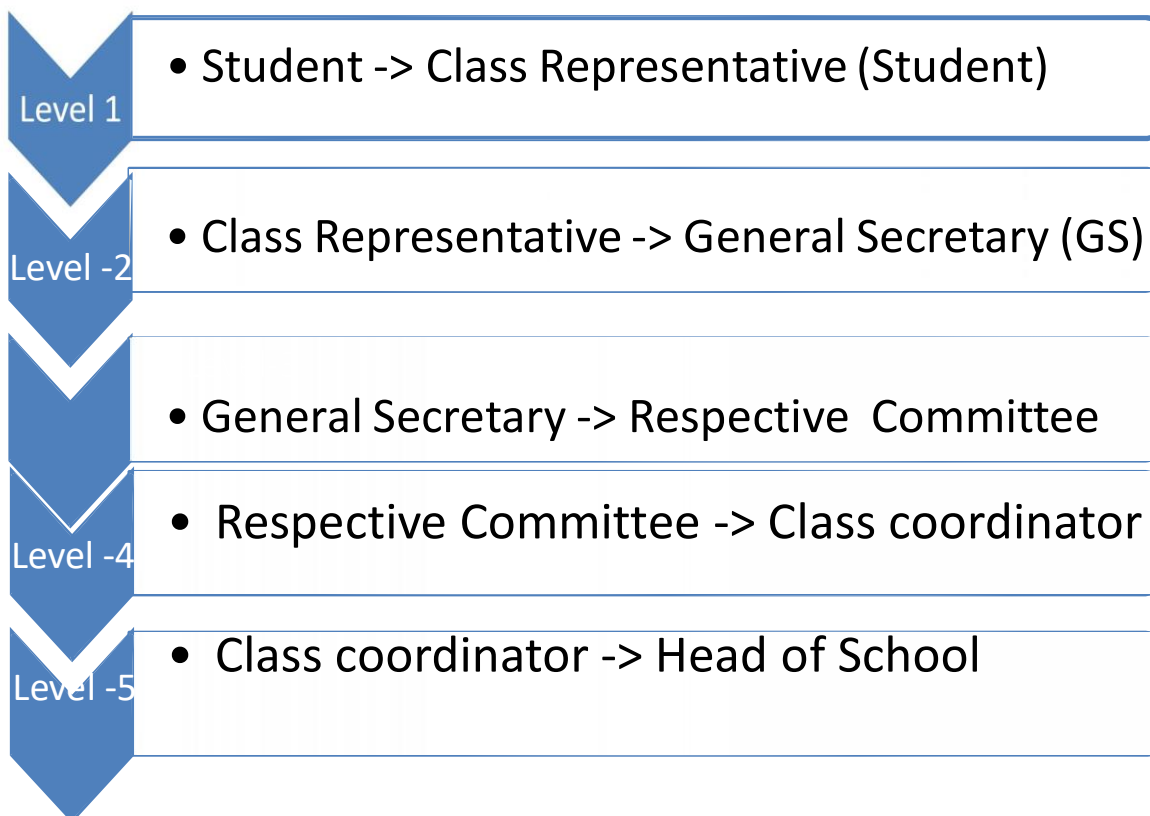
FACULTY DETAILS

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



GRIEVANCE REPORTING SYSTEM

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



Syllabus

Sem-1

PP Savani University

School of Sciences

Syllabus, Teaching and Examination Scheme

Course Name: Inorganic Chemistry – I

Course Code: SSCH1010

Prerequisite: Nil

Teaching and Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Examination

Objective(s) of the Course:

The present study enhances students' knowledge about Inorganic and Physical chemistry to understand their role in the field of sciences

To inculcate habits of scientific reasoning to do the task rationally

Course Contents:

Section-I			
Module	Content	Hours	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 effective nuclear 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. (e) Electronegativity, Pauling's/ Mulliken's/ Allred Rachow's, electronegativity scales, Variation of electronegativity with bond	12	40

	order, partial charge, hybridization, group electronegativity		
Section-II			
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

Reference Books:

Title	Authors	Publisher
Concise Inorganic Chemistry	J.D. Lee	Wiley India
Engineering Chemistry (16 th Edition)	P.C. Jain and Monika Jain	Dhanpat Rai publishing company
Essentials of Physical Chemistry	A.Bahl, B.S. Bahl and G.D. Tuli	S. Chand Publishing
Advanced Practical Physical Chemistry	J. B. Yadav	Krishna Prakashan Media
Vogel's Qualitative Inorganic Analysis 7 th Edition	G. Svehla, B. Sivasankar	Pearson

Course Name: Physical Chemistry – I

Course Code: SSCH1020

Prerequisite: Nil

Teaching and Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Examination

Objective(s) of the Course:

The present study enhances students' knowledge about Inorganic and Physical chemistry to understand their role in the field of sciences.

To inculcate habits of scientific reasoning to do the taskrationally

Course Contents:

Section-I			
Module	Content	Hours	Weightage (%)
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
Section-II			
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

Reference Books:

Title	Authors	Publisher
Concise Inorganic Chemistry	J.D. Lee	Wiley India
Engineering Chemistry (16 th Edition)	P.C. Jain and Monika Jain	Dhanpat Rai publishing company
Essentials of Physical Chemistry	A.Bahl, B.S. Bahl and G.D. Tuli	S. Chand Publishing
Advanced Practical Physical Chemistry	J. B. Yadav	Krishna Prakashan Media

Vogel's Qualitative Inorganic Analysis 7 th Edition	G. Svehla, B. Sivasankar	Pearson
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Course Name: Chemistry Practical

Course Code: SSCH1030

Prerequisite: Nil

Teaching and Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Examination

Objective(s) of the Course:

The present study enhances students' knowledge about Inorganic and Physical chemistry to understand their role in the field of sciences.

To inculcate habits of scientific reasoning to do the task rationally

Course Contents:

Module	Name of the practical	Hours
1.	Introduction to laboratory, safety rules during practical, knowledge about different 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.	6
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.	6
7.	Surface tension measurements of different solvents by stalagmometer	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

Reference Books:

Title	Authors	Publisher
Concise Inorganic Chemistry	J.D. Lee	Wiley India
Engineering Chemistry (16 th Edition)	P.C. Jain and Monika Jain	Dhanpat Rai publishing

		company
Essentials of Physical Chemistry	A.Bahl, B.S. Bahl and G.D. Tuli	S. Chand Publishing
Advanced Practical Physical Chemistry	J. B. Yadav	Krishna Prakashan Media
Vogel's Qualitative Inorganic Analysis 7 th Edition	G. Svehla, B. Sivasankar	Pearson

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School of Sciences

Syllabus, Teaching and Examination Scheme

Course Name: Environment Studies

Course Code: SSCH1070

Prerequisite: Nil

Teaching and Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Examination

Objective(s) of the Course:

To 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 Contents:

Section-I			
Module	Content	Hours	Weightage (%)
1	Multidisciplinary nature of environmental studies Definition, scope and importance, Need for public awareness.	02	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. Mineral resources: Use and exploitation, environmental effects of extracting 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	08	30

	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.		
Section-II			
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-spots 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

Reference Books:

Title	Authors	Publisher
The Biodiversity of India	Bharucha Erach	Mapin Publishing Pvt. Ltd

Environmental Biology	Agarwal, K.C.	Nidi Publ. Ltd. Bikane
Water Management in India	Bansil, P.C. 2004	Concept Publishing Company, India
Water Resources Management VII	Water Resources Management VII	WIT Press.

Course Name: WATER AND WATER RESOURCES

Course Code: SSES1080

Prerequisite: Nil

Teaching and Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Examination

Objective(s) of the Course:

To 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 Contents:

Section-I			
Module	Content	Hours	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
Section-II			
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	12	35

	patterns; watershed and drainage basins; importance of watershed and watershed management; rain water harvesting in urban settings.		
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

Reference Books:

Title	Authors	Publisher
The Biodiversity of India	Bharucha Erach	Mapin Publishing Pvt. Ltd
Environmental Biology	Agarwal, K.C.	Nidi Publ. Ltd. Bikane
Water Management in India	Bansil, P.C. 2004	Concept Publishing Company, India
Water Resources Management VII	Water Resources Management VII	WIT Press.

Course Name: Environment and Water Resources Practical

Course Code: SSES1090

Prerequisite: Nil

Teaching and Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Examination

Objective(s) of the Course:

To 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 Contents:

Section-I		
Module	Content	Hours
1	Visit to a local area to document environmental assets river/forest/grassland/hill/mountain	05
2	Visit to a local polluted site-Urban/Rural/Industrial/Agricultural	05

3	Describe the environmental problem of your locality and suggest a remedy.	05
4	Case Studies-I	05
5	Case Studies-II	05
6	Seminars	05
7	Collection of samples- air, water and soil	05
8	Determination of pH from soil and water samples	05
9	Estimation of D.O. in water	10
10	Determination of conductivity from soil samples	10

Reference Books:

Title	Authors	Publisher
The Biodiversity of India	Bharucha Erach	Mapin Publishing Pvt. Ltd
Environmental Biology	Agarwal, K.C.	Nidi Publ. Ltd. Bikane
Water Management in India	Bansil, P.C. 2004	Concept Publishing Company, India
Water Resources Management VII	Water Resources Management VII	WIT Press.

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School of Sciences

Syllabus, Teaching and Examination Scheme

Course Name: Introduction to Microbiology-I

Course Code: SSMB1010

Prerequisite: Nil

Teaching and Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Examination

Objective(s) of the Course:

To introduce the students with the field of microbiology

To make student aware about various types of microorganism and their general characteristics

To prepare the student for general microbiology lab practices and handling of microbes in laboratory

Course Contents:

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

Reference Books:

Title	Authors	Publisher
Microbiology	Prescott	McGraw-Hill

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

Course Name: Introduction to Microbiology -II

Course Code: SSMB1020

Prerequisite: Nil

Teaching and Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Examination

Objective(s) of the Course:

To introduce the students with the field of microbiology

To make student aware about various types of microorganism and their general characteristics

To prepare the student for general microbiology lab practices and handling of microbes in laboratory

Course Contents:

Section-I			
Module	Content	Hours	Weightage (%)
1	Microbial Classification, Systems of classification: Binomial Nomenclature, Whittaker's five kingdom and Carl Woese's three kingdom classification systems and their utility, Bacterial systematics	15	30
2	Major cell Morphologies, Morphology and Biology, Cell size and significance of smallness, Significance of surface to volume ratio, Lower limits of cell size.	11	25
Section-II			
3	Bacterial cell surface appendages, Pili, Fimbriae, Cell inclusions, Gas Vesicles, Endospores, Nucleoid, Chemotaxis, Structures responsible for motility in bacteria, Types of motility	11	25
4	Concept of Microscopy-resolution, simple and compound microscopy, various types of microscopy	08	20

Reference Books:

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

Course Name: Microbiology practical

Course Code: SSMB1030

Prerequisite: Nil

Teaching and Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Examination

Objective(s) of the Course:

To introduce the students with the field of microbiology

To make student aware about various types of microorganism and their general characteristics

To prepare the student for general microbiology lab practices and handling of microbes in laboratory

Course Contents:

Section-I		
Module	Content	Hours
1	Introduction to Microbiology Good Laboratory Practices and Biosafety	3
2	To study the principle and applications of important instruments: Biological safety cabinets, autoclave, incubator, BOD incubator	3
3	To study the principle and applications of important instruments: Hot air oven, light microscope, pH meter) used in the Microbiology laboratory	3
4	Sterilization of glassware, medium using autoclave and assessment for sterility	3
5	Sterilization of heat sensitive material by membrane filtration and assessment for sterility	3
6	Preparation of Nutrient broth and Nutrient agar medium	3
7	Demonstration of the presence of microflora in the environment by exposing nutrient agar plates to air	3

8	Microscopic observation of morphological characteristics of Protozoa/Yeast using compound microscope	3
9	Study of bacterial motility by hanging drop techniques	3
10	Preparation of culture media for microbes (bacteria, fungal, algal cultivation)	3

Reference Books:

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

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School of Sciences

Syllabus, Teaching and Examination Scheme

Course Name: Mathematics-I

Course Code: SCS1050

Prerequisite: Nil

Teaching and Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Examination

Objective(s) of the Course:

To develop understanding of fundamental mathematical concepts

To develop habits of providing solutions that include appropriate justification for their reasoning

Course Contents:

Section-I			
Module	Content	Hours	Weightage (%)
1	Function : Domain, Range, One-one, onto function, composition of functions, Complex number : Algebra of complex number. Quadratic equation and its solution.	06	20
2	Exponential & Logarithmic function : Elementary properties. Trigonometric functions : sine, cosine, tan, cot, cosec, sec and their inverse function. Formulae : $\cos(A \pm B)$, $\sin(A \pm B)$, $\tan(A \pm B)$, $\sin(2\theta)$, $\cos(2\theta)$, $\tan(2\theta)$.	08	26
Section-II			
3	Determinant: 2×2 , 3×3 order, Expansion, elementary properties, Matrices: 2×2 , 3×3 order, Algebra of matrices (Addition, Scalar product, product of two matrices)	08	27
4	Vector algebra : Vector space R^2 and R^3 Operation : Addition, scalar multiplication and vector multiplication, magnitude of vector, Inner product, Box/Triple product, angle between two vectors.	08	27

Reference Books:

Title	Authors	Publisher
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	Shantinakaran	S.Chand and Co.
Elementary Linear Algebra (Application Version)	Anton and Rorres	Wiley India Edition

Course Name: Mathematics Practical-I

Course Code: SSCH1050

Prerequisite: Nil

Teaching and Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)		
Theory	Practical	Tutorial	Credit	CE	ESE	Total
0	0	1	1	40	60	100

CE: Continuous Evaluation, ESE: End Semester Examination

Objective(s) of the Course:

To develop understanding of fundamental mathematical concepts

To develop habits of providing solutions that include appropriate justification for their reasoning

Course Contents:

Module	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 R^2 and R^3	3
10.	Inner Product	3

Reference Books:

Title	Authors	Publisher
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	Shantinakaran	S.Chand and Co.
Elementary Linear Algebra (Application Version)	Anton and Rorres	Wiley India Edition

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School of Sciences

Syllabus, Teaching and Examination Scheme

Course Name: Physics-I

Course Code: SSCH1040

Prerequisite: Nil

Teaching and Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Examination

Objective(s) of the Course:

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

Course Contents:

Section-I			
Module	Content	Hours	Weightage (%)
1	<p>General Physics</p> <p>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.</p> <p>Force of friction, laws of static and dynamic friction, limits of friction, friction a necessity and evil.</p>	07	20
2	<p>LASER & FIBER OPTICS</p> <p>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.</p> <p>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.</p>	08	25
Section-II			
3	<p>Properties of matter</p> <p>Stress and strain, Hooke's law, factors affecting elasticity, three</p>	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.		
4	<p>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.</p> <p>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</p>	08	30%

Reference Books:

Title	Authors	Publisher
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 Name: Physics Practical-I

Course Code: SSCH1040

Prerequisite: Nil

Teaching and Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)		
Theory	Practical	Tutorial	Credit	CE	ESE	Total
0	2	0	1	40	60	100

CE: Continuous Evaluation, ESE: End Semester Examination

Objective(s) of the Course:

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

Course Contents:

Module	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

Reference Books:

Title	Authors	Publisher
EngineeringPhysics	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
Elementary Linear Algebra (Application Version)	Anton and Rorres	Wiley India Edition

Sem-2

PP Savani University

School of Sciences

Syllabus, Teaching and Examination Scheme

Course Name: Organic & Physical Chemistry

Course Code: SSCH1060

Prerequisite: Nil

Teaching and Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Examination

Objective(s) of the Course:

The present study supports undergraduates to acquire the knowledge about the fundamental 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 Contents:

Section-I			
Module	Content	Hours	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 Arenes, 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 their mechanism, Aromatic addition reactions, Applications of benzene	8	27

Section-II			
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 History and introductions of 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, SNomenclature.	8	26

Reference Books:

Title	Authors	Publisher
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 10 th Edition	Peter Atkins and Julio de Paula	Oxford University Press
Organic Chemistry 7 th Edition	Robert Neilson Boyd, Saibal Kanti 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 Name: Physical Chemistry – II

Course Code: SSCH1070

Prerequisite: Nil

Teaching and Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Examination

Objective(s) of the Course:

The present study supports undergraduates to acquire the knowledge about the fundamental 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 Contents:

Section-I			
Module	Content	Hours	Weightage (%)
1	Solutions and Colligative Properties Dilute solutions; lowering of vapour pressure, Raoult's law, Real solution, elevation of boiling point, freezing point depression, Osmotic pressure, Isotonic solutions, Reverse Osmosis, colligative properties of electrolytes, Relation between van't hoff 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 conventions and units, First law of thermodynamics, enthalpy of system, Relation between ΔH and ΔE , 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
Section-II			
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, Pseudo 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 reaction rate, Limitations of the collision theory.	8	27
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 of adsorption, Ion-exchange adsorption, Applications of ion-exchange adsorption.	8	26
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Reference Books:

Title	Authors	Publisher
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 10 th Edition	Peter Atkins and Julio de Paula	Oxford University Press
Organic Chemistry 7 th Edition	Robert Neilson Boyd, Saibal Kanti 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 Name: Organic and Physical Chemistry Practical – II

Course Code: SSCH1080

Prerequisite: Nil

Teaching and Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Examination

Objective(s) of the Course:

The present study supports undergraduates to acquire the knowledge about the fundamental 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 Contents:

Section-I

Module	Content	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 NHCl at different initial concentrations.	6
10	To study the adsorption of given organic acid by animal charcoal.	6

Reference Books:

Title	Authors	Publisher
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 10 th Edition	Peter Atkins and Julio de Paula	Oxford University Press
Organic Chemistry 7 th Edition	Robert Neilson Boyd, Saibal Kanti 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

PP Savani University

School of Sciences

Syllabus, Teaching and Examination Scheme

Course Name: ECOLOGY AND ECOSYSTEMS I

Course Code: SSES1100

Prerequisite: Nil

Teaching and Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Examination

Objective(s) of the Course:

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 Contents:

Section-I			
Module	Content	Hours	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
Section-II			
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 population growth	6	30
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
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Reference Books:

Title	Authors	Publisher
Fundamentals of Ecology	Odum, E.P. 1971	W.B. Saunders.
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.
Physical Geography	Savindra Singh S	Prayag Pustak Bhavan ,Alhabad
Geology, Environment And Society	Valdiya K.S	University press

Course Name: PHYSICAL ENVIRONMENT I

Course Code: SSES1110

Prerequisite: Nil

Teaching and Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Examination

Objective(s) of the Course:

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 Contents:

Section-I			
Module	Content	Hours	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 processesradiation, green house effect, conduction, compression, condensation ☐ Cooling processes- evaporation, expansion, advection, temperatureinversions	15	40
2	Atmosphere ☐ Composition of the atmosphere ☐ Aircomposition, density, thermal structure and stratification ☐ Factors affecting global distribution of insolation ☐ Causes and effects of: insolation; pressure & winds; monsoonsystem; humidity phenomena; air masses; precipitation; types of clouds.	10	35
Section-II			
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
4			

Reference Books:

Title	Authors	Publisher
Fundamentals of Ecology	Odum, E.P. 1971	W.B. Saunders.
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.
Physical Geography	Savindra Singh S	Prayag Pustak Bhavan ,Alhabad
Geology, Environment And Society	Valdiya K.S	University press

Course Name: Ecology and Physical Environment Practical

Course Code: SSES1120

Prerequisite: Nil

Teaching and Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Examination

Objective(s) of the Course:

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 Contents:

Section-I		
Module	Content	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

Reference Books:

Title	Authors	Publisher
Fundamentals of Ecology	Odum, E.P. 1971	W.B. Saunders.
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.
Physical Geography	Savindra Singh S	Prayag Pustak Bhavan ,Alhabad
Geology, Environment And Society	Valdiya K.S	University press

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School of Sciences

Syllabus, Teaching and Examination Scheme

Course Name: Cell Biology-I

Course Code: SSBT1040

Prerequisite: Nil

Teaching and Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Examination

Objective(s) of the Course:

To learn about cell and its organelles

To develop basic understanding for cellular structures and their functions

To make students understand process about cell division and cancer

Course Contents:

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

Reference Books:

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

Course Name: Cell Biology -II

Course Code: SSBT1050

Prerequisite: Nil

Teaching and Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Examination

Objective(s) of the Course:

To learn about cell and its organelles

To develop basic understanding for cellular structures and their functions

To make students understand process about cell division and cancer

Course Contents:

Section-I			
Module	Content	Hours	Weightage (%)
1	The Cell cycle and its Regulation via various Checkpoints	10	25
2	Mitosis: cell division of somatic cell, Various Phases (Prophase, Prometaphase, Metaphase, Anaphase, Telophase), Forces required for Mitotic Movements, Cytokinesis	12	25
Section-II			
3	Meiosis: cell division of gametic cell, Various Phases in Meiosis I and Meiosis II, Genetic recombination during Meiosis	13	25
4	Oncology: study of Cancer, types and molecular basis of cancer, Programmed cell death (PCD)	10	25

Reference Books:

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

Course Name: Cell Biology practical

Course Code: SSBT1060

Prerequisite: Nil

Teaching and Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Examination

Objective(s) of the Course:

To learn about cell and its organelles

To develop basic understanding for cellular structures and their functions

To make students understand process about cell division and cancer

Course Contents:

Section-I		
Module	Content	Hours
1	Study of structure of Prokaryotic and Eukaryotic cells	3
2	To study osmosis	3
3	Demonstration of dialysis	3
4	To study of plasmolysis and de-plasmolysis	6
5	To study various Cell division stages in onion root tip	3
6	Estimation of reducing sugar by Cole's method	3
7	Estimation of reducing sugar by Folin-lowry's method	3
8	Quantitative estimation of amino-acids by Ninhydrin method	3

9	Microscopic observation of Drosophila compound eyes	3
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Reference Books:

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

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School of Sciences

Syllabus, Teaching and Examination Scheme

Course Name: Physics-II

Course Code: SSCH1090

Prerequisite: Physics-I

Teaching and Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Examination

Objective(s) of the Course:

The aim is to provide comprehensive knowledge and understanding in the various fields and enable students to pursue the subject at a cutting-edge level future

Course Contents:

Section-I			
Module	Content	Hours	Weightage (%)
1	MAGNETIC MATERIALS: Magnetic moment, Magnetic dipole, Magnetic Field strength, Magnetic flux density, Intensity of magnetization, Magnetic dipole moment, Magnetic Field intensity, Magnetic permeability, magnetic susceptibility, Bohr magnetron, Classification of Magnetic Materials on the basis of magnetic moment ,Soft and Hard Magnetic Materials, Anti-ferromagnetic materials, Ferrites	07	20
2	ACOUSTIC AND ULTRASONIC: Introduction, Classification and Characteristics of sound Sabine's formula for reverberation (Without Derivations) Introduction of Absorption co-efficient Sound absorbing materials Factors affecting the acoustics of building and their remedies Sound Insulation. Properties of ultrasound Generation of ultrasound by (1) piezoelectric method and (2) Magnetostriction method Methods for Ultrasound Velocity measurement Applications of ultrasound	08	25%
Section-II			
3	CRYSTAL STRUCTURE SOLIDS: Amorphous and Crystalline Materials. Lattice Translation Vectors. Lattice with a Basis – Central and Non-Central Elements. Unit Cell. Reciprocal Lattice. Types of Lattices. Brillouin Zones. Types of Bonds. Ionic Bond. Covalent Bond.	07	25%

	Van der Waals Bond. Diffraction of x-rays by Crystals. Bragg's Law.		
4	ELECTROMAGNETIC INDUCTION: Definition Faradays Laws, Fleming's right hand rule, Lenz's Law, Statically and dynamically induced emf. Self-inductance, mutual inductance and coefficient of coupling. Energy stored in magnetic field. Force on current carrying conductor placed in a magnetic field, Fleming's left hand rule.	08	30%

Reference Books:

Title	Authors	Publisher
Engineering Physics	V Rajendran	Tata McGraw Hill Education
Engineering Physics	Khan B. H	Tata McGraw Hill Publishing Company Ltd., New Delhi, 2006

Course Name: Physics Practical-II

Course Code: SSCH1090

Prerequisite: Nil

Teaching and Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)		
Theory	Practical	Tutorial	Credit	CE	ESE	Total
0	2	0	1	40	60	100

CE: Continuous Evaluation, ESE: End Semester Examination

Objective(s) of the Course:

The aim is to provide comprehensive knowledge and understanding in the various fields and enable students to pursue the subject at a cutting-edge level future

Course Contents:

Module	Name of Practical/Tutorial	Hours
1.	To study the Hysteresis loss.	4
2.	Determination of the velocity of ultrasonic waves in liquid by ultrasonic interferometer.	4
3.	Study of CRO & Measurement of Voltage Amplitude & Frequency	4
4.	Basic understanding of step up and down transformer.	4
5.	To use a Multimeter for measuring (a) Resistances, (b) A/C and DC Voltages, (c) AC and DC Currents, (d) Capacitances, and (e) Frequencies.	4
6.	Understanding the basic logic gates AND, OR, NOT.	4
7.	Faraday's Law	4
8.	Introduction to virtual lab (Amrita Vishwa Vidyapeetham Virtual Lab)	2

Reference Books:

Title	Authors	Publisher
Engineering Physics	V Rajendran	Tata McGraw Hill Education
Engineering Physics	Khan B. H	Tata McGraw Hill Publishing Company Ltd., New Delhi, 2006

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School of Sciences

Syllabus, Teaching and Examination Scheme

Course Name: Mathematics-II

Course Code: SSCH1100

Prerequisite: Differentiation and Basics of Matrices

Teaching and Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Examination

Objective(s) of the Course:

To develop understanding of various mathematical concepts

To apply precise, logical reasoning to problem solving

Course Contents:

Section-I			
Module	Content	Hours	Weightage (%)
1	Function and Limit Function: Concept and Examples, Limit : Concept of Limit, Standard Formulae and related Examples.	06	20
2	Differentiation Definition, Rules of, Sum, Product, Quotient of Functions, Chain Rule, Derivative of Implicit functions and Parametric functions, Logarithmic Differentiation. Successive Differentiation up to second order	09	30
Section-II			
3	Integration Concept, Integral of Standard Functions, Working Rules of Integration, Integration by Parts, Integration by Substitution Method, Definite Integral and its properties.	09	30
4	Application of Differentiation and Integration Velocity, Acceleration, Maxima & Minima. Area and Volume	06	20

Reference Books:

Title	Authors	Publisher

Engineering Mathematics (third edition)	Anthony croft and others	Pearson Education,2012
Polytechnic Mathematics	Prakash D S	S Chand
Calculus I: Differentiation and Integration	Dan Hamilton	Hamilton Education Guides

Course Name: Mathematics Practical-II

Course Code: SSCH1100

Prerequisite: Nil

Teaching and Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)		
Theory	Practical	Tutorial	Credit	CE	ESE	Total
0	0	1	1	40	60	100

CE: Continuous Evaluation, ESE: End Semester Examination

Objective(s) of the Course:

To develop understanding of various mathematical concepts

To apply precise, logical reasoning to problemsolving

Course Contents:

Module	Name of Practical/Tutorial	Hours
1.	Function and Limit 1	3
2.	Function and Limit 2	3
3.	Differentiation 1	3
4.	Differentiation 2	3
5.	Differentiation 2	3
6.	Integration 1	3
7.	Integration 2	3
8.	Integration 3	3
9.	Application of Differentiation and Integration 1	3
10.	Application of Differentiation and Integration 2	3

Reference Books:

Title	Authors	Publisher
Engineering Mathematics (third edition)	Anthony croft and others	Pearson Education,2012
Polytechnic Mathematics	Prakash D S	S Chand
Calculus I: Differentiation and Integration	Dan Hamilton	Hamilton Education Guides

P P Savani University

SCHOOL OF SCIENCES

ACADEMIC RULES AND REGULATIONS

1. Abbreviations:

SOS: School of Sciences

2. Course Coordinator

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

3. Course Evaluation

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

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

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

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

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

4. Promotion Rules

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

5. Examination Schedule

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

6. Conduction of Examination

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

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

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

7. UFM (Unfair Means):

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

Unfair Means shall include the following:

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

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

UFM Process & Review:

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

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

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

Norms of Punishment:

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

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

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

8. Result Declaration:

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

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

ACADEMIC CALENDER 2020-21

P. P. SAVANI SCHOOL OF SCIENCES

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

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

Abstract: Calculated working Days

July 2020 – Dec 2020

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

Jan 2021 – May 2021

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