Government College Theog, Shimla
Bachelor of Science with Chemistry

Department of Chemistry
Program Outcomes and Course Outcomes

Aims of the Bachelor's Degree Program with Chemistry

- To build a strong conceptual chemical knowledge base
- Prepare the students for both, academia and employability.
- Inculcating values related to well-being, emotional stability, critical thinking, social justice and also skills for employability
- Train students with sound theoretical and experimental knowledge that suits the need of academics and industry
- To prepare students for the society at large

Graduate Attributes

- Disciplinary Knowledge
- Communication skills
- Critical thinking
- Problem Solving
- Analytical reasoning
- Research related skills
- Team Work
- Cooperation
- Scientific reasoning
- Reflective thinking
- Digital literacy
- Self-directed learning
- Multicultural competence
- Moral and ethical awareness
- Leadership Qualities
- Lifelong Learning

Qualification Descriptors for Graduates in B.Sc. with Chemistry

The qualification description for B.Sc. with Chemistry includes

- Demonstration of a comprehensive knowledge based on concepts, principles and theories relating to chemistry that spans the traditional sub-disciplines (inorganic chemistry, organic chemistry, physical chemistry, analytical chemistry, and biochemistry) as well as advanced and emerging topics.
- Demonstration of an ability to apply underlying concepts and principles outside the context in which they were first studied and in interdisciplinary scenarios.
- Acquisition of competence in the use of routine materials, techniques, and practices of chemistry.
- Exhibition of skills required for conducting the documented laboratory procedures as well as well-developed skills for the gathering, evaluation, analysis and presentation of information, ideas, concepts and quantitative and/or qualitative data.
- Acquisition of skills in the operation of standard chemical instrumentation.
- Demonstration of skills in the use of safety data sheets, safe-handling of chemical materials, considering their physical and chemical properties including any specific hazards associated with their use.
- Development of literature searching and information management skills

Programme Learning Outcomes in B.Sc. with Chemistry

- Develop in depth knowledge of the core concepts and principles that are central to the understanding of this core science discipline.
- Undergraduates pursuing this programme of study go through laboratory work that specifically develops their quantitative and qualitative skills, provides opportunities for critical thinking and team work, and exposes them to techniques useful for applied areas of scientific study.
- Theoretical knowledge and understanding of the fundamental concepts, principles, and processes in Main branches of chemistry, namely, organic chemistry, inorganic chemistry, physical chemistry, analytical chemistry and biochemistry.
- Laboratory Skills: Quantitative, analytical and instrument based: A much valued learning outcome of this programme is the laboratory skills that students develop during the course
- Communication: Opportunities to enhance students' ability to write methodical, logical and precise reports are inherent to the structure of the programme
- Capacity Enhancement: Developing abilities in students to think independently as well as be able to work productively in groups.
- Portable Skills: These are problem solving, numeracy and mathematical skills- error analysis, units and conversions, information retrieval skills, IT skills and organizational skills.

Comprehensive Continuous Assessment (CCA) and yearly Scheme in BSc with Chemistry of Three years

Scheme of Examination

English shall be the medium of instructions and Examinations.

Examinations shall be conducted at the end of each year as per the academic calendar notified by H.P. University Shimla-5

Each course of 6 credits will carry 100 marks (theory + practical) and will have following components:

I. Theory 50 marks

Yearly Examination

II. Comprehensive Continuous Assessment 30 marks

a) Assignment/Quiz/Seminar/model/ Mid-Term Examination 15 marks

b) Attendance 05 marks

c) Lab Seminar /Lab CCA 10 marks

II. *Practical 20 marks*

Practical examination will have following components:

i) Performing the two practical exercises assigned by the examiner in terms of requirement of chemicals/apparatus/ theory/ reaction
(if any) involved, procedure/ scheme/ observations/calculations and results. 10 marks

ii) viva-voce examination 5 marks

iii) Practical note book and regularity during practical classes 5 Marks

Theory Paper (CCA + yearly Examination) +Practical [30 +50 +20] =100 marks

Each Skill Enhancement course will be of 4 credits and scheme of examination for these courses is as under:
{CCA + yearly Examination [30 + 70] =100 marks}

Criterion for marks on the basis of Class-room attendance (0 - 5 marks) under component CCA/ IA be defined as follows:

a) Attendance 75 -- 80% = 3 marks
b) Attendance 81 – 90 % = 4 marks
c) Attendance 91% and above = 5 marks
d) Candidates securing 75% Attendance after condonation will not be entitled to get any mark.

Assessment methods

Assessment methods have two major objectives:

- The primary one is to assess the learning outcomes of the course in tune with the broad outcomes of strengthening core theoretical knowledge base and practical laboratory skills. This is assessed by comprehensive summative end-semester examinations conducted for both theory and practical courses. Also In-course assessments are given in every course in order to assess the students mastery of various learning outcomes. These assessments include individual assignments, group assignments, laboratory notebooks, written reports, quizzes, class tests and periodical tests.
- Another objective is to improve the students' learning and teachers' teaching. Results of assessments and their critical analysis are used to improve the process further by focusing on the areas that need conceptual strengthening, laboratory exposure or design of new experiments.

Detail of Courses

Class	Course Name	Course Code	Description	Credits Theory	Practical
BSc 1st Year	ATOMIC STRUCTURE, BONDING, GENERAL ORGANIC CHEMISTRY & ALIPHATIC HYDROCARBONS	CHEM 101	• Structure of Atom: Bohr's Theory, Schrodinger Wave Equation, Slater's Rule • Covalent Bond: Hybridisation, VSEPR Theory, MOT • Ionic Bond: Born Haber's Cycle, Fajan's Rule • Fundamentals of Organic Chemistry • Stereochemistry • Aliphatic Hydrocarbons: Alkanes, Alkenes, Alkynes	4	2
	Objectives: Sections A and B of the course provide a comprehensive review of the atom's structure, laying a crucial foundation for understanding chemical bonding in compounds. It covers essential topics				

such as ionic, covalent, and metallic bonding, emphasizing that chemical bonding exists on a continuum between these cases.

Sections C and D focus on Organic Chemistry and are designed to be an integral part of the students' organic chemistry education in subsequent classes. The course reinforces fundamental concepts while introducing a new approach to visualizing organic molecules in three-dimensional space. The application of these concepts is established through the introduction of functional groups such as alkanes, alkenes, alkynes, and aromatic hydrocarbons. The course's structure strongly supports the students' learning of these concepts and their practical applications.

Learning Outcomes:

Upon completing the course, students will be able to:

- Apply their knowledge of the quantum mechanical model of the atom, quantum numbers, electronic configuration, radial and angular distribution curves, shapes of s, p, and d orbitals to solve conceptual questions.
- Calculate Effective Nuclear Charge by using Slater's Rule
- Construct plausible structures and determine molecular geometries using Radius Ratio Rules, VSEPR theory, and MO diagrams (including homo- and hetero-nuclear diatomic molecules).
- Understand the concept of lattice energy using the Born-Landé Equation. Understand the role of ionic character in covalent bonds by employing Fajan's Rule.
- Recognize the significance and application of chemical bonds, intermolecular, and intramolecular weak chemical forces, and their impact on properties such as melting points, boiling points, solubility, and energetics of dissolution.

	• Understand and explain the diverse properties and behaviors of organic compounds based on the fundamental concepts learned. • Identify Various Reactive Intermediates during Chemical Reactions • Distinguish between Aromatic and Non-Aromatic compounds. • Understand the fundamental concepts of stereochemistry • Methods of preparation and properties of Aliphatic Hydrocarbons including alkanes, alkenes and alkynes				
	STATES OF MATTER, CHEMICAL KINETICS & FUNCTIONAL ORGANIC CHEMISTRY	CHEM 102	• Kinetic Theory of Gases • Liquid State • Solid State • Chemical Kinetics • Aromatic Hydrocarbons • Alkyl Halides • Aryl Halides • Alcohols • Phenols • Ethers	4	2
	Objectives: Develop a comprehensive understanding of the three states of matter, including basic and advanced concepts. Derive mathematical expressions to determine the physical properties of gases, liquids, and solids. Gain insights into the factors that influence the rate and mechanism of chemical reactions.				

	Sections on Organic Chemistry: The Organic Chemistry sections are designed to enhance comprehension of organic functional groups, including halogenated hydrocarbons and oxygen-containing functional groups, along with their reactivity patterns. Detailed discussions on reaction mechanisms for each functional group will reveal the breadth of organic chemistry and the extent of organic transformations. The functional group approach will be introduced as a means to study organic chemistry, with a focus on applications, preparation methods, and reactions of various compound classes, including aromatic hydrocarbons, alkyl and aryl halides, alcohols, phenols and ethers, and aldehydes and ketones. This course aims to establish the relationship between the structure of organic compounds and their physical and chemical properties. *Learning Outcomes:* *Upon completing the course, students will be able to:* • Derive mathematical expressions for the physical properties of gases, liquids, and solids, and understand their physical significance. • Comprehend and apply the Kinetic Theory of Gases and the Maxwell-Boltzmann distribution. • Explain crystal structures and calculate properties related to cubic systems. • Understand the concept of viscosity and surface tension, and explore their practical applications. • Recognize the importance of Crystal Systems and Miller Indices. • Grasp the concepts and theories of reaction rates. • Derive integrated rate equations for zero, first, and second-order reactions. • Understand the preparation, properties, and reactions of aromatic compounds,

<table>
<tr><td></td><td colspan="5">haloalkanes, haloarenes, and oxygen-containing functional groups</td></tr>
<tr><td rowspan="2">BSc 2nd Year</td><td>SOLUTIONS, PHASE EQUILIBRIUM, CONDUCTANCE, ELECTROCHEMISTRY & ORGANIC CHEMISTRY</td><td>CHEM 201</td><td>Solutions
Phase Equilibrium
Conductance
Electrochemistry
Carboxylic Acids
Carboxylic Acid Derivatives
Amines and Diazonium Salts
Carbohydrates</td><td>4</td><td>2</td></tr>
<tr><td colspan="5">Objectives:
Familiarize students with ideal and non-ideal solutions, including Raoult's law, partially miscible and immiscible solutions, and their practical applications. Develop the ability to draw Vapour Pressure-Composition Curves and Temperature-Composition Curves for both Ideal and Non-Ideal Solutions. Emphasize the importance of the Gibbs Phase Rule and the Clausius-Clapeyron Equation, and their application to equilibrium between phases, with a focus on one-component and simple eutectic systems. Provide an understanding of electrochemical cells, including electrolytic and galvanic cells, measurement of conductance, and its various applications. Also, cover the measurement of electromotive force (emf) and its practical applications. Introduce the topics of carboxylic acids and their derivatives, carbohydrates, amines, and diazonium salts. Foster comprehension of conductance, the anomalous behavior of strong electrolytes, laws governing ion migration in solutions, and the application of conductance measurements in titration methods. Establish an understanding of the kinetics of chemical reactions.</td></tr>
</table>

Learning Outcomes:

By the end of the course, the students will be able to:

- Explain the concepts of different types of binary solutions, including miscible, partially miscible, and immiscible solutions, and demonstrate their practical applications.
- Describe the thermodynamic aspects of equilibria between phases and construct phase diagrams for simple one-component and two-component systems.
- Explain the factors that affect conductance, ion migration, and the application of conductance measurements.
- Understand the different types of galvanic cells, their Nernst equations, emf measurements, and calculations of thermodynamic properties and other parameters.
- Comprehend phase equilibrium, criteria, the Clausius-Clapeyron equation, and the Gibbs-Duhem-Margules equation.
- Acquire knowledge about the working principles of electrochemical cells, galvanic cells, corrosion, and their environmental implications in electrochemistry.

CHEMISTRY OF MAIN GROUP ELEMENTS, CHEMICAL ENERGETICS AND EQUILIBRIA	CHEM 202	• Hydrogen • s- Block Elements • p- Block Elements • Noble Gases • Thermodynamics • Chemical Equilibrium • Ionic Equilibrium	4	2

Objectives:

The primary objective of CHEM 202 is to develop a solid understanding of the fundamentals involved in studying the properties and applications of s and p-block elements and their compounds. The course is divided into sections focusing on thermodynamics and chemical equilibrium. The thermodynamics section aims to familiarize students with key concepts, terminology, properties of thermodynamic systems, the laws of thermodynamics, and their connections to other branches of physical chemistry. It also equips students with the ability to apply thermodynamic principles to systems of variable compositions, equilibrium, and colligative properties. The section on chemical equilibrium delves into the basics and applications of chemical and ionic equilibrium.

Learning Outcomes:

By the end of the course, the students will be able to:

- Understand the chemistry and practical applications of s and p-block elements, as well as noble gases.
- Comprehend the properties and significance of hydrogen in various chemical contexts.
- Grasp the three laws of thermodynamics, including the concept of state and path functions, and differentiate between extensive and intensive properties.
- Derive expressions for the changes in internal energy (ΔU), enthalpy (ΔH), entropy (ΔS), Gibbs free energy (ΔG), and Helmholtz free energy (ΔA) for ideal gases under different conditions.
- Explain the concept of partial molar properties and its relevance in thermodynamics.

	• Understand the thermodynamic basis of colligative properties and their applications in various chemical environments. • Overall, this course aims to provide students with a solid foundation in the properties of s and p-block elements, thermodynamics, and chemical equilibrium, enabling them to apply these concepts to real-world scenarios and further their understanding of physical chemistry.				
	BASIC ANALYTICAL CHEMISTRY	CHEM 203	• Introduction to Analytical Chemistry • Analysis of soil • Analysis of water • Analysis of food products • Chromatography • Analysis of Cosmetics • Instrumental Demonstration	4	
	Objectives: The primary objective of this course is to provide students with an understanding of the importance and concepts of chemical analysis applied to water and soil. The course covers topics such as sampling, accuracy, precision, and statistical tests (F, Q, and t tests). It also focuses on separation techniques like chromatography and instrumentation techniques such as flame photometry and spectrophotometry. Students will be exposed to essential separation methods like solvent extraction and chromatography. Practical sessions will allow students to work with state-of-the-art instrumentation and learn to detect analytes in mixtures.				

Learning Outcomes:

By the end of the course, the students will be able to:

- Handle analytical data with proficiency and accuracy.
- Determine the composition and pH of soil, providing valuable insights for agricultural purposes.
- Apply separation techniques to separate mixtures effectively.
- Perform experiments with precision and accuracy.
- Develop independent methods of analysis for different types of samples.
- Test and analyze contaminated water samples.
- Understand the basic principles and operation of instruments such as the Flame Photometer and UV-vis spectrophotometer.
- Apply knowledge of geometrical isomers and keto-enol tautomers in the context of chemical analysis.
- Determine the composition of soil and evaluate its properties.
- Estimate macronutrient levels using Flame Photometry, a specialized analytical technique.

Through this course, students will gain the necessary skills and knowledge to analyze water and soil samples, utilize various analytical techniques, and interpret the obtained results accurately, contributing to their understanding of environmental and agricultural aspects related to chemical analysis.

	FUEL CHEMISTRY & CHEMISTRY OF COSMETICS & PERFUMES	CHEM 204	• Energy Sources • Coal • Petroleum and Petrochemical Industry • Lubricants • Cosmetics • Essential Oil	4	
	Objectives: CHEM 204 aims to provide students with a solid scientific and technical foundation in the production, behavior, and handling of hydrocarbon fuels and lubricants. The course also covers emerging alternative and renewable fuels, ensuring that students are equipped to contribute effectively to the field of petroleum chemistry and technology. Additionally, the course introduces students to the world of cosmetic chemistry, recognizing the significant role cosmetics play in enhancing appearance, self-esteem, and confidence. It provides theoretical and practical knowledge on the basic principles of cosmetic chemistry and the manufacturing and formulation of various cosmetic products. The course aims to provide students with a basic scientific and technical understanding of the production, behaviour and handling of hydrocarbon fuels and lubricants, including emerging alternative & renewable fuels. This will enable them to be industry ready to contribute effectively in the field of petroleum chemistry and technology.				

Learning Outcomes:

By the end of the course, the students will be able to:

- Understand the fundamental chemistry underlying petroleum fuel technology, including the refining processes used to produce fuels and lubricants.
- Comprehend how differences in chemical composition influence the properties of fuels and their application in various contexts.
- Gain knowledge about the origin of petroleum, crude oil composition, and the industrial refining processes employed to obtain different fractions of petroleum.
- Familiarize themselves with various alternative and renewable fuels, such as different generations of biofuels and gaseous fuels (e.g., CNG, LNG, CBG, Hydrogen).
- Recognize fuel product specifications and become familiar with the different test methods used to qualify various types of fuels, as well as characterization techniques.
- Review the global and Indian energy scenario, including renewable and non-renewable energy sources.
- Understand the types of crude oils, their composition, properties, and the process of crude oil assay.
- Gain a foundational understanding of cosmetics, including various cosmetic formulations, the role of ingredients in cosmetic products, and the use of safe, economical, and body-friendly cosmetics.
- Develop the skills to prepare innovative formulations in the field of cosmetics.

By the end of the course, students will possess the necessary knowledge and skills to excel in the areas of petroleum chemistry, alternative fuels, and cosmetic chemistry. They will be equipped to contribute to the petroleum industry, understand the challenges and opportunities

	associated with alternative and renewable fuels, and engage in the formulation and development of cosmetic products				
BSc 3rd Year	POLYNUCLEAR HYDROCARBONS, DYES, HETEROCYCLIC COMPOUNDS AND SPECTROSCOPY (UV, IR, NMR)	CHEM 301	• Polynuclear Hydrocarbons Naphthalene, Anthracene, Phenanthrene • Synthetic dyes • Heterocyclic compounds Pyrrole, Furan, Thiophene & Pyridine Indole, Quinoline, Isoquinoline • Application of UV and IR Spectroscopy to Simple Organic Molecules • Nuclear Magnetic Resonance Spectroscopy	4	2
	Objectives: The course introduces the synthesis, properties and structure of polynuclear hydrocarbons (Naphthalene, Anthracene and Phenanthrene). The students will learn about various type of Dyes. The preparations and properties of Heterocyclic compounds like Pyrrole, Furan, Thiophene, Pyridine, Indole, Quinoline and Isoquinoline will also be discussed. The course also introduces the learner to various tools and techniques for identifying and characterizing the organic compounds through their interactions with electromagnetic radiation viz. UV-Visible, IR				

	and NMR spectroscopy. *Learning Outcomes:* *By the end of the course, the students will be able to:* • Understand the structure and properties of polynuclear hydrocarbons. • Draw the molecular orbital diagrams of polynuclear hydrocarbons and heterocyclic compounds. • Understand the chemical reactivity of polynuclear hydrocarbons and heterocyclic compounds. • Gain insight into the basic principles of UV, IR and NMR spectroscopic techniques. • Use spectroscopic techniques to determine structure and stereochemistry of known and unknown • compounds. • Learn about the theory of colour and constitution as well as the chemistry of dyeing. • Know applications of various types of dyes including those in foods and textiles.				
	POLYMER CHEMISTRY	CHEM 305	• Introduction and history of polymeric materials • Kinetics of Polymerization • Crystallization and crystallinity • Polymer Solution • Properties of Polymers	4	2
	Objectives:				

	The primary objective of this paper is to help the student to know about the synthesis, properties and applications of polymers. Learn about the chemistry of natural and synthetic polymers including fabrics and rubbers. Understand the chemistry of biodegradable and conducting polymers and appreciate the need of biodegradable polymers with emphasis on basic principles. *Learning Outcomes:* *By the end of the course, the students will be able to:* • Know about history of polymeric materials and their classification • Learn about different mechanisms of polymerization and polymerization techniques • Evaluate kinetic chain length of polymers based on their mechanism • Differentiate between polymers and copolymers • Learn about different methods of finding out average molecular weight of polymers • Differentiate between glass transition temperature (Tg) and crystalline melting point (Tm) • Determine Tg and Tm • Know about solid and solution properties of polymers • Learn properties and applications of various useful polymers in our daily life.				
	CHEMICAL TECHNOLOGY & SOCIETY AND BUSINESS SKILLS FOR CHEMISTRY	CHEM 307	• Chemical Technology • Exploration of societal and technological issues from a chemical perspective. • Business Basics • Chemistry in Industry	4	

			• Making money • Intellectual property		

Objectives:

This course will help students to connect chemical technology for societal benefits. It would fulfil the gap

between academia and industries. The course aims to give insights into the basics of the Intellectual Property (IP) and in its wider purview it encompasses intricacies relating to IP. This course is designed to introduce a learning platform to those who may be involved in the making and creation of various forms of IP, besides the effective management of IPR of other creators. The course may also provide cursory understanding of the overall IP ecosystem in the country.

Learning Outcomes:

By the end of the course, the students will be able to:

- Understand the use of basic chemistry to chemical engineering
- Learn and use various chemical technology used in industries
- Develop scientific solutions for societal needs
- Learn theoretical concepts of evolution of Intellectual Property Laws, and to differentiate between
- the different kinds of IP.
- Know the existing legal framework relating to IP in India.
- Comprehend the value of IP and its importance in their respective domains.
- This course may motivate the students to make their career in multifaceted field of intellectual property rights.

	PESTICIDE CHEMISTRY & PHARMACEUTICAL CHEMISTRY	CHEM 308	• General introduction to pesticides • Synthesis and technical manufacture and uses of representative pesticides • Drugs & Pharmaceuticals • Fermentation Aerobic and anaerobic	4	

Objectives:

Pesticide plays an important role in controlling quantity as well quality of the economic crops by protecting them from the various pests. They are used for prevention of much spoilage of stored foods and used for prevention of certain diseases, which conserves health and has saved the lives of millions of people and domestic animals. Keeping the importance of pesticides in mind this course is aimed to introduce synthesis and application of pesticides. The objective of this paper is to develop basic understanding of drugs discovery, design, development, and their side effects. The course will cover synthesis of major drug classes including-analgesics, antipyretics, anti- inflammatory agents, antibacterial and antifungal agents, antiviral agents, central nervous system agents and drugs for HIV--AIDS. An overview of fermentation process and production of certain dietary supplements and certain common antibiotics will be discussed.

Learning Outcomes:

By the end of the course, the students will be able to:

- Students will be able to learn about the basic role of pesticide in everyday life, various

	ingredients and their role in controlling the pest. Students can also educate the farmers/gardeners to choose the appropriate pesticides for their crop production. • Gain insight into retro-synthesis approach in relation to drug design and drug discovery. • Learn synthetic pathways of major drug classes. • Understand the fermentation process and production of ethanol, citric acids, antibiotics and some classes of vitamins.

Add On/Bridge Courses Offered by the Department

Class	Name of Course	Description	Agency
All Students of the Department	**Avogadro**	Skill Development Value Added Course	IIT Bombay Spoken Tutorials
	ChemCollective Virtual Labs	Skill Development Value Added Course	IIT Bombay Spoken Tutorials
	GChemPaint	Skill Development Value Added Course	IIT Bombay Spoken Tutorials
	Jmol Application	Skill Development Value Added Course	IIT Bombay Spoken Tutorials
	PhET Simulations for Chemistry	Skill Development Value Added Course	IIT Bombay Spoken Tutorials
	UCSF Chimera	Skill Development Value Added Course	IIT Bombay Spoken Tutorials
	Biopython	Skill Development Value Added Course	IIT Bombay Spoken Tutorials
	CellDesigner	Skill Development	IIT Bombay Spoken Tutorials

		Value Added Course	
	Inkscape	Skill Development Value Added Course	IIT Bombay Spoken Tutorials
	Arduino	Skill Development Value Added Course	IIT Bombay Spoken Tutorials
	Linux	Skill Development Value Added Course	IIT Bombay Spoken Tutorials
	JAVA	Skill Development Value Added Course	IIT Bombay Spoken Tutorials
	Digital Divide	Skill Development Value Added Course	IIT Bombay Spoken Tutorials
	Latex	Skill Development Value Added Course	IIT Bombay Spoken Tutorials
	Libre Office	Skill Development Value Added Course	IIT Bombay Spoken Tutorials
	HTML	Skill Development Value Added Course	IIT Bombay Spoken Tutorials
BSc 1st Year	**Standard Operating Procedure (SOP)**	Bridge Course Guidelines, Procedures and Rules	Department of Chemistry, Government College Theog Shimla

	for **Safe Handling of Chemicals & Laboratory Safety**	followed by the Department of Chemistry, Government College Theog to ensure safe handling of chemicals and a safe environment in the Chemistry laboratories	


Spoken Tutorial
Learn Free/Libre and Open Source Software through Spoken Tutorial - IIT Bombay
https://spoken-tutorial.org
FrontAccounting
Accounting Software
Blender (3D)
GIMP
Inkscape
LibreOffice Draw
Synfig (2D)
Animation and Graphics
Java Business Application
Application Software
Android app using Kotlin
Apps
Audacity
Audio/Video
BioPython
CellDesigner
UCSF Chimera
Biochemistry
DWSIM
Chemical Engineering
Avogadro
ChemCollective Virtual Labs
GChemPaint
Jmol Application
Chemistry
OpenFOAM (Salome)
Computational Fluid Dynamics
Python 3.4.3
Scilab
Computational Software
Python 3.4.3
R
Data Science
LibreOffice Base
MySQL
RDBMS PostgreSQL
Database Management
eSim
EDA Tools
QGIS
GIS
Arduino
eSim
IoT
Content available in 22 Indian languages
Scan the QR code to visit Spoken Tutorial website
Forum help available to all learners
Moodle
Learning Management System
Koha
Library Management System
BASH
Linux
Linux AWK
Linux for Sys-Ads
Ubuntu Linux on VirtualBox
OS and Scripting Software
Apps on Physics
ExpEYES
Physics
Advanced C++
C/C++
Java
NetBeans
PERL
PHP and MySQL
Ruby
Programming Software
OpenIPSL
OpenModelica
Simulator
Biogas Plant
Fitter
InStore Promoter
Skill Development
Basic IT Skills
(LibreOffice Suite & Firefox)
GeoGebra 5.X
KTouch
KTurtle
LibreOffice Draw
Marble
PhET
Tux Typing
Software for School
Firefox
gedit
LaTeX
LibreOffice Suite
Thunderbird
Linux OS
Utility Software
Git
Version Control System
Python Django
Python Flask
Web Frameworks
CSS
Drupal
HTML
Joomla
Website Building
For more details write to contact@spoken-tutorial.org
Spoken Tutorial project is funded by
National Mission on Education through ICT, MHRD, Govt. of India
and
Pandit Madan Mohan Malaviya
National Mission on Teachers and Teaching (PMMMNMTT), MHRD, Govt. of India