

JoVE Journal

The world's first peer-reviewed scientific video journal indexed in PubMed, Web of Science, SciFinder, Scopus and SCI Expanded. Scientific research is published in video form alongside text protocols, bringing to life the intricate details of experimental methods.

JoVE Encyclopedia of Experiments

This first-of-its-kind online video encyclopedia of advanced research experiments combines animations visualizing theory and videos demonstrating techniques in real university laboratories.

JoVE Journal

Behavior

ISSN 1940-087X

Includes observational and experimental approaches that seek to understand human and animal behavior

Bioengineering

ISSN 1940-087X

Publishes experimental approaches to investigate the structure, function and interactions of biological molecules.

Biochemistry

ISSN 1940-087X

Features the application of engineering tools in life sciences to study biological processes and develop new therapies and diagnostics.

Biology

ISSN 1940-087X

Publishes standard techniques and novel experimental approaches in the fields of cellular, molecular, and organismal biology aimed at understanding the functions of live and living organisms.

Cancer Research

ISSN 1940-087X

Illustrates experimental approaches in biomedical research and clinical practice aimed at understanding, detecting, treating and preventing cancer

Chemistry

ISSN 1940-087X

Includes fundamental and applied research in organic, inorganic, analytical and physical chemistry

Developmental Biology

ISSN 1940-087X

Covers research studies of biological development at all levels, ranging from cellular to whole organisms.

Engineering

ISSN 1940-087X

Dedicated to research methods across different fields of engineering, including mechanical, electrical, materials and chemical.

Environment

ISSN 1940-087X

Dedicated to studies that seek to better understand Earth's ecosystem, address environmental concerns and suggest solutions for protecting natural resources.

Genetics

ISSN 1940-087X

Covers a wide array of experimental approaches used to investigate gene function, gene regulation, epigenetics, genetic disorders, population genetics and evolution.

Immunology & Infection

ISSN 1940-087X

Covers studies of the immune system, mechanisms of infection, biological response to pathogens, as well as therapeutic agents and their efficacy in treating diseases.

Medicine

ISSN 1940-087X

Connects biomedical research and clinical medicine featuring case studies, clinical procedures, surgeries, clinical trial methodologies and animal models of disease and treatment.

Neuroscience

ISSN 1940-087X

Devoted to the study of the brain and nervous system. Also features potential treatments for neurological diseases.

JoVE Encyclopedia of Experiments

BIOLOGY

Includes observational and experimental approaches that seek to understand human and animal behavior

***Caenorhabditis elegans* (worm)**

ISSN 2690-4454

Features research techniques for the metazoan *Caenorhabditis elegans*. This nematode worm is a powerful model system due to its transparent body, defined developmental plan, robust genetic tools and neuro-behavioral paradigms.

***Danio rerio* (zebrafish)**

ISSN 2690-4454

Displays various research techniques for studies using the model organism, *Danio rerio*, in its embryo, larva, and adult stages. These methods are used by researchers to explore a wide range of physiological and behavioral questions and create disease models for screening various chemicals.

***Drosophila melanogaster* (fruit fly)**

ISSN 2690-4454

Presents research techniques for the model organism *Drosophila melanogaster* at each stage of its life cycle. These methods are used by researchers to explore a wide range of physio-logical & behavioral questions.

Large Animal Models

ISSN 2690-4454

Shows research methods using porcine, bovine, equine, and leporine (rabbit) models at their embryonic, neonatal, and adult stages. These techniques include ex-vivo and in-vivo studies, organ harvesting & preservation methods, cell isolation & culturing methodologies, microbial culturing, biochemical & biophysical assays, diagnostic tests, & various surgical procedures.

Rodent Models

ISSN 2690-4454

Illustrates research methods using rodent models in embryonic, neonatal, and adult stages. The techniques include in vitro and in vivo organ perfusion, tissue and organ isolation, microbial culturing, biochemical studies, organ transplant methodologies, behavioral tests, and surgical procedures.

CANCER RESEARCH

Collections (categorized by organs of origin) present experiments relating to the detection, treatment and prevention of cancer.

Breast Cancer

ISSN 2767-567X

Features research techniques for the study of breast cancer. This collection includes different procedures, cell culture practices, and cancer-cell response and behavioral studies employed to advance research on breast cancer prevention, detection and treatment.

Cancers of the Nervous System

ISSN 2767-567X

Indicates protocols relating to cancers originating in the nervous system. The techniques include intra-brain injections, in-vivo and in-vitro tumor modeling, cell and organelle culturing, extracellular vesicle harvesting and purification methodologies, proteomic analysis, organ isolation and preservation methods, cell migration assays, tissue engineering methods, and novel gene delivery approaches.

Colorectal Cancer

ISSN 2767-567X

Highlights some fundamental research techniques in colorectal cancer relating to screening tests, genetic analysis, studies on the gut microbiome, therapeutic interventions, animal model generation, assay techniques, and cell behavior & metastatic responses.

Gastrointestinal Cancer

ISSN 2767-567X

Identifies protocols relating to cancers originating in the regions or organs associated with the gastrointestinal tract. The collection comprises research protocols on cell isolation, culturing, and adhesion studies, tissue staining and histological analysis, DNA methylation studies, tissue preservation methods, exosome analysis, and generation of animal models.

JoVE Encyclopedia of Experiments

Gynecologic Cancer

ISSN 2767-567X

Showcases protocols relating to the prevention, detection, and treatment of cancer originating from cells or regions of the female reproductive system. The protocols are relevant for cancer-targeting and detection approaches, metabolic assessment of cancer cells, developing in vivo and metastatic animal models, in vitro cell culture and assay techniques, and transplantation experiments.

Head and Neck Cancer

ISSN 2767-567X

Includes protocols relating to head and neck cancer modeling in vitro, in ovo, and in vivo, cell isolation and culture, fluorescent in situ hybridization-related techniques, generation of decellularized tissue matrices, and drug-resistance characterization assays.

Leukemia

ISSN 2767-567X

Highlights a set of in vitro assay techniques to analyze leukemic cell growth and metabolism, cell isolation and culture methods, approaches to characterize and study cellular morphology, and genetic manipulation procedures.

Lung Cancer

ISSN 2767-567X

Covers techniques relating to the generation of lung cancer animal models, cancer cell characterization, treatment and detection strategies, in vitro culture studies, assays and isolation techniques that facilitate lung cancer research.

Pancreatic Cancer

ISSN 2767-567X

Presents protocols demonstrating the generation of pancreatic animal models, genetic engineering of pancreatic cancer cells, methods for in vitro modeling of pancreatic cancer, cell isolation and characterization techniques, and tumor cell behavior and response studies.

Prostate Cancer

ISSN 2767-567X

Displays techniques employed in prostate cancer research relating to cancer cell/organoid culture, processing, and staining, cell and tissue sampling, organ extractions, in vivo & in vitro cancer modeling, and cancer proteomics studies.

Skin Cancer

ISSN 2767-567X

Focuses on research approaches relating to melanoma and other types of skin cancer. The protocols feature techniques relevant to developing in vitro and in vivo skin carcinogenesis and metastatic models, cell culturing, skin regeneration approaches, genetic manipulation and sensitivity studies using skin cells, and assay techniques.

Urinary Tract Cancer

ISSN 2767-567X

Exhibits protocols relating to cancers originating in the regions or organs of the urinary or renal system. The techniques include organs, tissue, and cell harvesting procedures, organotypic culturing approaches, in vivo cancer modeling studies, decellularized tissue matrix generation, stem cell-related and electrophysiology studies, genetic-engineering strategies, tissue staining and imaging techniques, and protein expression analysis.

BIOLOGICAL TECHNIQUES

Feature basic and advanced experimental procedures used in biological research.

Assay Techniques

ISSN 2834-8400

Feature various bioanalytical techniques to assess the activity, potency, or localization of test substances in living organisms performed at the macromolecular, sub-cellular, cellular, or organism level. Assay outcomes are detected directly or indirectly by visualizing the responses via colorimetric, enzymatic, or electrophysiological measurement methods.

Biomolecular Interaction Detection Techniques

ISSN 2834-8400

Demonstrate various methods and techniques used to study protein-protein interactions. These approaches encompass scientific tools and technologies, such as biosensors, imaging techniques, assays, and spectroscopy, that provide insights into the intricate world of protein interactions and their roles in biological systems, enabling a deeper understanding of the events that transpire at the molecular level. These interactions are fundamental in numerous cellular activities, including signal transduction, enzymatic reactions, gene regulation, and structural organization.

Blot Techniques

ISSN 2834-8400

Encompass a variety of meticulous methods employed for the quantification and detection of biomolecules, spanning DNA, RNA, and proteins, contributing to a comprehensive understanding of biological systems. This collection features diverse applications, including the precise quantification and detection of biomolecules, assessing genetic material, examining epigenetic modifications, and measuring protein expression levels.

Chromatography Techniques

ISSN 2834-8400

Explain the mechanisms behind separating and purifying various analytes such as proteins, lipids, carbohydrates, antibody-drug conjugates, and small molecules from complex mixtures using column, capillary, or plate-based systems. The highlights include chromatographic separation methods using ion exchange, standard and reverse-phase, affinity, size-exclusion, gas-based, and thin-layer dependent techniques.

Electrophoresis Techniques

ISSN 2834-8400

Highlight the mechanisms behind various electrophoresis techniques to separate biomolecules such as DNA, RNA, peptides, individual proteins, protein complexes, and amyloids. These methods utilize variants of agarose gel- or polyacrylamide gel-based matrices to separate biomolecules under the influence of an electric field.

Gene Transfer Techniques

ISSN 2834-8400

Showcase gene transfer methods, including viral vector-mediated transduction and non-viral vector-mediated physical and chemical transfection techniques to deliver genetic material in cultured cells and in vivo animal models at their embryonic and adult stages. Highlights include transfection utilizing hydrodynamics, microinjection, biolistics, nucleofection, and magnetofection techniques, and transduction via retroviral, adenoviral, nanoblade, and lentiviral systems.

Genome Editing Techniques

ISSN 2834-8400

Cover techniques used for genome editing in cultured bacterial, animal, and plant cells and in vivo animal models. These methods highlight the applications of CRISPR technology, Zinc finger nucleases, TALENs, transposition and recombination events, shRNA, siRNA, and vector based transformations to achieve gene knock-in, gene knock-out, and gene regulations.

Microscopy Techniques

ISSN 2834-8400

Comprise an array of advanced experimental techniques in the field of microscopy and imaging, aimed at investigating various biological and cellular processes. These techniques enable researchers to visualize and study dynamic cellular events, molecular interactions, and structural features with high resolution and specificity.

PCR Techniques

ISSN 2834-8400

Extend to a range of applications and methods that utilize Polymerase Chain Reaction (PCR) to identify and examine genetic markers, mutations, and sequences. These techniques encompass mutation detection, annealing temperature optimization, genetic marker quantification, infection diagnosis, enumeration of infective particles, nucleic acid amplification, analysis of epigenetic modifications, and detection of transcript variants.

JoVE Encyclopedia of Experiments

Spectroscopy Techniques

ISSN 2834-8400

Highlight various spectroscopy techniques that are relevant in molecular biology. Based on the principle that molecules absorb or emit light at specific wavelengths or frequencies, spectroscopy allows for the measurement of light absorption, emission, or scattering. These techniques provide valuable insights into the composition, structure, interactions, and dynamics of molecules involved in biological processes.

Staining Techniques

ISSN 2834-8400

Feature methods for staining biomolecules such as lipids, carbohydrates, and proteins; and different cell types ranging from individual plant or animal cells to various tissue sections. These methods help visualize and characterize a wide variety of biological samples by improving their contrast.

IMMUNOLOGY

Covers innovative methods in basic and advanced experimental procedures driving biomedical advancements

Antibody-Based Technologies

ISSN 2994-5631

Covers antibody production, purification, functionality assays, and applications in imaging, detection, and analysis, aiding researchers in advancing biomedical discoveries and therapies.

Immune Systems and Components

ISSN 2994-5631

Feature experimental procedures for isolating, culturing, differentiating, and analyzing immune cells, exploring the immune system using human and mouse models.

Immune Response

ISSN 2994-5631

Explores immune responses, including pathogen interactions, inflammation, receptor signaling, and cell activation. Using techniques like flow cytometry and immunoassays, it provides insights into immune system dynamics during infections, treatments, and stimuli.

Immunopathology

ISSN 2994-5631

Examines pathogen-immune system interactions, immune responses, and disease development using in vivo and ex vivo models. It highlights techniques to study immunopathology, advancing therapeutic interventions and understanding of immune-related diseases.

Immunodiagnostics

ISSN 2994-5631

Presents assays to study immune responses and immunomodulation, covering bacterial infection detection, cytotoxicity, cell interactions, and cytokine bioactivity. Using imaging, flow cytometry, and fluorescent assays, it aids in understanding immune function and developing therapies.

Immunotherapy

ISSN 2994-5631

Showcases immunotherapy protocols, including CAR T-cell production, siRNA treatments, and novel vaccines. Techniques like CRISPR and viral transduction advance understanding and treatment of complex diseases, driving immunotherapy innovation.

Neuroscience

Explores neuronal cultures, neural function, and behavior, using tools like 3D scaffolds, microfluidics, optogenetics, and imaging to study neurogenesis and circuits.

Neuronal Cultural Techniques

ISSN 3065-5374

Cover neuronal culture techniques, from basic neuron cultures to advanced methods like 3D scaffolds, microfluidics, and brain organoids. It includes co-cultures for studying neuron-glia interactions, synapse formation, and neurogenesis in vitro.

Neurophysiology

ISSN 3065-5374

Feature methods to study neural function, including electrical activity recording, optical techniques for dynamic visualization, and stimulation tools like electrical, magnetic, and optogenetics to examine and modulate neural circuits.

JoVE Core

Video textbooks for introductory courses which can serve as effective primary or supplementary teaching resources. Key concepts are brought to life through high-impact animations and scientist-in-action videos of experiments conducted in laboratory settings.

JoVE Business

Business video textbooks that explain concepts taught in undergraduate courses through high-impact animations.

JoVE Lab Manual

Curriculum-focused video resources that support teaching and learning of commonly taught introductory labs. Three separate videos with step-by-step instructions for each lab experiment illustrate lab preparation for instructors, key theoretical concepts, and a protocol for students.

JoVE Science Education

A revolutionary video library dedicated to teaching scientific and clinical fundamentals through easy-to-understand video demonstrations. With text translations and subtitles in over 10 languages, 500+ videos capture key conceptual and methodological details that are difficult to visualize using text alone.

JoVE Business

Marketing

ISSN 2998-1247

Showcases clear animated lessons on applying marketing principles in real-world scenarios. It covers marketing's role in business, consumer behavior, and methods to create, deliver, and communicate value, emphasizing ethical practices.

Microeconomics

ISSN 2998-825X

Uses animated lessons to explain economic decision-making, covering demand, supply, market equilibrium, cost structures, and market types like competition and monopoly, with real-world applications.

Finance

ISSN 2998-8608

Provides animated lessons on finance principles, covering decision-making, resource management, investing, and financial planning, offering insights into core concepts and real-world applications.

JoVE Core

Analytical Chemistry

ISSN 2997-5948

Simplifies complex chemical principles with clear animations, covering topics from SI Units to NMR spectroscopy. Scientist-in-action videos showcase real-world applications in global lab research.

Anatomy & Physiology

ISSN 2993-334X

Showcases human anatomy and physiology through clear animations, covering structures, functions, and requirements. Scientist-in-action videos demonstrate real-world medical and research applications.

Biology

ISSN 2644-0369

Brings biology to life through over 300 concise and easy-to-understand animated video lessons that explain key concepts in biology, plus more than 150 scientist-in-action videos that show actual research experiments conducted in today's laboratories.

Cell Biology

ISSN 2832-2568

Illustrates complex cellular processes in easy-to-understand yet comprehensive animated video lessons. This collection focuses on the essential components and functions of cells, including organelles and membranes, cellular transport, and cell energetics. It is complemented by scientist-in-action videos that demonstrate the application of cell biology in real-world research experiments.

Chemistry

ISSN 2694-1031

Explains general chemistry concepts using concise and easy-to-understand animated video lessons. Plus, in the scientist-in-action videos, we demonstrate classical and original research experiments performed in today's laboratories worldwide.

Civil Engineering

ISSN 2997-5999

Explores essential construction materials like bricks, steel, and concrete through animations, covering properties, manufacturing, and applications. Science-in-action videos showcase related lab experiments.

Electrical Engineering

ISSN 2997-5999

Provides animated videos on electric circuits and analysis, covering first- and second-order circuits, operational amplifiers, and circuit transformations. Practical examples and scientist-in-action videos enhance understanding and real-world application.

Intro to Psychology

ISSN 3065-8209

JoVE Core Introduction to Psychology offers concise video lessons on cognitive processes, emotional regulation, and neural mechanisms, providing an engaging foundation in psychology.

Mechanical Engineering

ISSN 2994-5291

Offers animated videos on equilibrium, forces, and structural mechanics, with real-world and research applications.

Medical-Surgical Nursing

ISSN 3065-8489

JoVE Core Medical-Surgical Nursing offers animated lessons on body systems, diseases, and nursing care, providing practical insights for managing patients in clinical settings.

Molecular Biology

ISSN 2767-1461

Provides an in-depth look at the cellular and extracellular processes of life. Explains key concepts and theory through 2-3 minute videos featuring high-impact animations and scientist-in-action experiment demonstrations.

Nursing

ISSN 2837-5971

Showcases concise animated lessons on nursing practices, covering health systems, nursing organizations, and health concepts. It includes practical communication, infection prevention, and nursing fundamentals, providing students with a clear understanding of nursing principles.

Organic Chemistry

ISSN 2769-4496

Covers thermodynamics, stereochemistry, reaction mechanisms, and more through clear animations, with scientist-in-action videos showcasing experiments worldwide.

Pharmacokinetics and Pharmacodynamics

ISSN 3065-5331

Covers PK/PD basics, including biopharmaceutics, drug modeling, and concentration-response relationships, with lab videos showcasing real-world applications.

Pharmacology

ISSN 2994-5240

Demonstrates engaging animations that explain fundamental concepts, including drug effects, classification, and pharmacokinetics. Scientist-in-action videos illustrate real-world research conducted in today's laboratories.

Physics

ISSN 2832-0557

Explores physics fundamentals like kinematics, dynamics, and waves through clear animations and lab videos demonstrating real-world applications.

Social Psychology

ISSN 2690-778X

Brings the foundations of our social world to life. Through 66 concise and easy-to-understand animated video lessons, we explain key concepts in the field. Plus, in another 25 scientist-in-action videos, we demonstrate classical and original research experiments performed in the laboratory.

Statistics

ISSN 2771-6244

Teaches data collection, analysis, and interpretation through animations, with lab videos demonstrating real-world statistical applications.

JoVE Lab Manual

Biology

ISSN 2643-458X

Provides faculty and students with step-by-step instructions for commonly taught lab classes in Biological Sciences. There are three separate videos for each lab experiment: preparation for instructors, key theoretical concepts, and a protocol for students.

Chemistry

ISSN 2691-3356

Supports faculty and students with step-by-step instructions for commonly taught lab classes in Chemistry. There are three separate videos for each lab experiment: preparation for instructors, key theoretical concepts, and a protocol for students.

JoVE Science Education

ADVANCED BIOLOGY

Contains 6 collections capturing key conceptual and methodological details that are difficult to visualize using text alone.

Cell Biology

ISSN 2578-2754

Provides a glimpse into the field of cell biology and profiles five important cellular phenomena: cell division, motility, endocytosis and exocytosis, metabolism and cell death.

Developmental Biology

ISSN 2578-2746

Introduces the field of developmental biology and covers five areas: developmental genetics, molecular developmental biology, stem cell biology, organogenesis, and aging and regeneration.

Genetics

ISSN 2578-6326

Focuses on genetics and incorporates five broad subdisciplines: the genetics of individuals and populations, genetics and disease, gene expression, epigenetics and genetic engineering.

Immunology

ISSN 2689-3649

Covers many staple techniques of immunology labs, demonstrates proliferation methods for immune cells and antibodies, as well as common assays for immune activity including ELISA. Finally, it demonstrates staining and imaging of immune tissue and cell samples.

Microbiology

ISSN 2689-3657

Demonstrates the key tools of microbiological investigation, such as proper sterile technique and plating, using selective media and enriching samples, culturing methods for mixed or pure samples, and more.

Neuroscience

ISSN 2578-790X

Provides an introduction to the field of neuroscience, exploring five major branches of study: neurophysiology, neuroanatomy, cell and molecular neuroscience, behavioral neuroscience and developmental neuroscience.

BASIC BIOLOGY

Contains 6 collections focused on lab equipment, safety and animal research, as well as basic biology techniques and fundamentals.

Basic Methods in Cellular And Molecular Biology

ISSN 2578-1952

Demonstrates how to execute basic techniques commonly used in cellular and molecular biology.

General Laboratory Techniques

ISSN 2578-630X

Exhibits how to use standard pieces of laboratory equipment essential in many experiments.

Lab Safety

ISSN 2578-7209

Provides safety guidelines for working with hazardous materials and equipment. It covers universal topics such as PPE, electrical safety, general emergency guidelines, and more.

Biology I: yeast, Drosophila And C. elegans

ISSN 2578-2649

Features three model organisms commonly used in life sciences research, includes methodology to maintain them in the laboratory.

Biology II: Mouse, Zebrafish, and Chick

ISSN 2578-2657

Features three vertebrate species commonly used in life sciences research, includes methodology on how they are maintained in the laboratory.

Lab Animal Research

ISSN 2578-7756

Visualizes a comprehensive video guide for appropriate lab animal care and use. Since a majority of biomedical research is focused on studies involving rodents, it is critical that every scientist learns the essential procedures demonstrated in these videos.

CHEMISTRY

Features 6 collections focused on key laboratory fundamentals, concepts and techniques across organic chemistry, inorganic chemistry, biochemistry, general and analytical chemistry.

Analytical Chemistry

ISSN 2578-126X

Takes a broad look at quantitative analysis and instrumentation including electrochemistry, spectroscopy, chromatography, and mass spectrometry.

Biochemistry

ISSN 2578-2037

Presents commonly used purification methods, such as affinity chromatography, as well as analytical methods, like MALDI-TOF. In addition, the videos showcase methods for assessing biomolecule interaction and function, such as co-immunoprecipitation and metabolic labeling.

General Chemistry

ISSN 2578-6067

Helps provide a solid foundation in general chemistry by showcasing basic lab techniques, demonstrating commonly used equipment, and exploring the theory behind fundamental methodology in Chemistry.

Inorganic Chemistry

ISSN 2578-6318

Covers a range of inorganic chemistry protocols and concepts including air-free techniques, syntheses of transition metal based compounds, core inorganic chemistry concepts like Lewis Acid and Bases, and advanced analysis techniques including EPR spectroscopy.

Organic Chemistry

ISSN 2578-7918

Helps provide a solid foundation in general chemistry by showcasing basic lab techniques, demonstrating commonly used equipment, and exploring the theory behind fundamental methodology in Chemistry.

Organic Chemistry II

ISSN 2578-7896

Covers the theory and reactions necessary to carry out syntheses on a more advanced level. In addition, a few videos introduce methods commonly used to analyze the reaction products such as infrared spectroscopy and polarimetry.

CLINICAL SKILLS

Features 7 collections devoted to physical examinations, clinical care, nursing skills, emergency medicine and critical care techniques, and COVID-19 procedures.

Coronavirus / COVID-19 Procedures

ISSN 2692-5605

Demonstrates procedures for healthcare workers who are screening and treating patients for COVID-19/Coronavirus.

Emergency Medicine and Critical Care

ISSN 2578-4935

Delves into a wide range of procedures employed in emergency and intensive care settings, ranging from basic life support methods such as CPR and rescue breathing to other common procedures performed during emergency situations.

Nursing Skills

ISSN 2578-7853

Showcases medication preparation and administration, with videos highlighting important safety checks, considerations, dosage calculations, and common mistakes associated with improper medication administration.

Physical Examinations I

ISSN 2578-823X

Provides a foundation for performing physical exams; with techniques ranging from measuring blood pressure or vital signs, to key pulmonary and cardiovascular physical examinations.

Physical Examinations II

ISSN 2578-8264

Is a specialized edition featuring methodologies and procedures associated with more sensitive and comprehensive physical exams such as HEENT exams, abdominal exams, and pelvic exams.

Physical Examinations III

ISSN 2578-9090

Covers physical examination of two major systems in our body: neurological and musculoskeletal, with videos explaining relevant anatomy, the rationale behind the steps, and the interpretation of the exam findings.

Physical Examinations IV

ISSN 2834-3514

Includes tutorials for using point of care ultrasound techniques to augment physical exams, and a guide to conducting comprehensive mental status exams. It also details modifications to physical exams for patients of different ages, or those who use a wheelchair.

ENGINEERING

Features 8 collections devoted to mechanical, chemical, electrical, structural, materials, biomedical, bioengineering, and aeronautical engineering.

Aeronautical Engineering

ISSN 2689-3665

Introduces fundamental concepts in aeronautical engineering with a focus on methods to evaluate aerodynamic performance, techniques to visualize subsonic and supersonic flow patterns, and procedures to calibrate measurement systems for real-time flight control.

Bioengineering

ISSN 2578-2614

Covers core bioengineering concepts, which include production of biomaterials, histotypic and whole organ tissue cultures, bioprocessing techniques, and the complex system-level fields of bioMEMs and biosensing.

Biomedical Engineering

ISSN 2640-0499

Describes the central concepts in biomedical engineering with a focus on imaging techniques to visualize and detect medical conditions, methods to quantify biomechanical strain, and computational modeling to simulate blood flow.

Chemical Engineering

ISSN 2578-3610

Explains fundamental concepts in chemical engineering using an experimental approach and it presents necessary operating procedures of various apparatuses such as the tray dryer and the viscometer.

Electrical Engineering

ISSN 2578-370X

Demonstrates electrical safety techniques for commonly used equipment in an electrical laboratory, introduces elements such as inductors, transformers, convertors, rectifiers, and inverters.

Materials Engineering

ISSN 2640-0510

Features cutting-edge methods for analysis and characterization of materials, and introduces a range of advanced materials and processes for new technologies and applications.

Mechanical Engineering

ISSN 2578-7829

Introduces a range of concepts that are essential for understanding and designing mechanical systems. Each video examines a specific topic and describes fundamental analytical methods commonly employed to understand physical behaviors.

Structural Engineering

ISSN 2640-0464

Introduces students to fundamental concepts and protocols for material characterization, with specific emphasis on common construction materials such as steel, wood, and concrete.

ENVIRONMENTAL SCIENCES

3 collections focused on environmental microbiology, earth science, environmental science key concepts and techniques.

Earth Science

ISSN 2578-367X

With a variety of demonstrations including physical and chemical properties of minerals and the analysis of rock formations, this collection features topics ranging from geology to geochemistry.

Environmental Microbiology

ISSN 2578-4943

Provides an introduction to microbial communities in the environment and their roles in ecosystems and also explores common methods used to study environmental microbiology.

Environmental Science

ISSN 2578-5966

Utilizes an interdisciplinary approach to explore and evaluate environmental systems with topics ranging from soil and water contaminants, invasive species, alternative energy and forestry.

PHYSICS

Contains 2 collections devoted to fundamental concepts and laboratory techniques in physics.

Physics I

ISSN 2578-9074

Covers classical mechanics and thermodynamics discussing relevant laws and equations. Every topic is presented with experiments validating theoretical hypothesis, and real world contextual examples.

Physics II

ISSN 2578-9082

Explains underlying principles behind physical phenomena that have changed our world, this collection explores topics including electrostatics, magnetism, optics, wave-based oscillations, and electrical circuits.

PSYCHOLOGY

Contains 7 collections focused on experimental, cognitive developmental, social and neuropsychology concepts and techniques, behavioral science, and sensation and perception.

Behavioral Science

ISSN 2578-1375

Presents the fundamentals of behavior neuroscience and focuses on the concepts of learning, memory, cognition, movement, addiction and behavioral disorders.

Cognitive Psychology

ISSN 2578-3602

Describes a number of influential paradigms used to study complex mental processes underlying attention, perception, learning and memory.

Developmental Psychology

ISSN 2578-3645

Explores the experimental domains of attention and perception, reasoning, social learning and memory processes - highlighting the dynamic changes that emerge throughout infancy and childhood.

Experimental Psychology

ISSN 2578-6237

Provides a framework for observing how psychological experiments are embedded in the actual research process, starting from the initial research design to arriving at conclusions in a study.

Neuropsychology

ISSN 2578-7845

Presents multidisciplinary techniques in behavior, neurophysiology, anatomy, and functional imaging to help diagnose brain damage and mental disorders.

Sensation and Perception

ISSN 2578-9104

Delves into a variety of procedures to study how the brain processes our complex sensory world and solves problems confronting conscious awareness and visual, tactile, and auditory perception.

Social Psychology

ISSN 2578-9112

Features classical methods used to investigate how social contexts influence people's actions, thoughts, and attitudes and provides a transparent look into social experiments.