Collection Subject Statement: Engineering

Last Reviewed: May 2025

Purpose
The Engineering collection in the University of Pittsburgh Library System (ULS) supports the academic programs and research needs of the students, faculty, and staff across the university. The collection supports degrees from a two-year A.S. program and multiple B.S., M.S., and Ph.D. programs. The Pittsburgh campus offers B.S. through Ph.D. degrees from six departments in the Swanson School of Engineering: Bioengineering, Chemical & Petroleum, Civil & Environmental, Electrical & Computing, Industrial Engineering, and Mechanical Engineering & Materials Science (MEMS). In addition, an interdisciplinary B.S. in Engineering Science is offered, which combines understanding of a discipline in physical science and/or mathematics with engineering. The Bradford campus offers an A.S. in Engineering Science and B.S. degrees in Energy Engineering Technology, Energy Science and Technology, and Mechanical Engineering Technology. The Johnstown campus offers B.S. degrees in chemical, civil, computer, electrical, and mechanical engineering. At Greensburg and Bradford students may complete a one- or two-year program that provides the prerequisites for transferring to another Pitt campus to complete a degree in their choice of engineering specialty. Relevant materials are located primarily in the Bevier Library, Hanley Library, Owen Library, and Thomas Blvd. Library.

Audience
The collection primarily serves the needs of students, faculty, and researchers in the departments of engineering across the university. Collection materials may also be of interest to those in other disciplines doing related work, such as biological sciences, business, chemistry, computing, economics, environmental science, geology, management, materials science, neuroscience, physics, and certain health sciences. A few of the research centers with close ties to the Swanson School of Engineering are the Mascaro Center for Sustainable Innovation, the Petersen Institute of NanoScience and Engineering (PINSE), and the McGowan Institute for Regenerative Medicine. In addition, engineering related materials may be acquired to support adult and high school learners participating in classes at the Manufacturing Assistance Center at the Titusville campus.

Guiding Principles and Areas of Focus
The collection is intended to represent the broad range of study and research in the engineering disciplines named above. More specific areas of focus include the following:

Bioengineering: bioimaging and signals; medical product engineering; neural engineering; molecular, cellular, and systems engineering; biomechanics; tissue engineering and regenerative medicine. In addition, there is a recent emphasis on translational research from academia to improve patient care and speed delivery of technology to patients and clinical settings.

Chemical & Petroleum: energy – generation and storage, enhanced oil recovery, carbon capture and sequestration; process engineering and sustainability; catalysis; nanomaterials and other novel materials and their applications; computational science and modeling applications; polymers; drug delivery.

Civil & Environmental: structural engineering; steel and concrete structures (including buildings, bridges, dams, highways, airports); transportation; fluid and soil mechanics; geotechnical design; environmental design; sustainability; water, wastewater, and solid/hazardous waste treatment facilities; water resources; construction management.

Electrical & Computing: power systems; electromagnetics; semiconductor devices; electronic circuit design; signal processing; control theory and devices; computer organization and architecture; embedded systems; computer networks; digital systems; AI architectures and algorithms; information security; systems and project engineering.

Industrial Engineering: operations research; analytics; optimization algorithms; stochastic modeling; machine learning; statistics and data science, healthcare decision making; energy and sustainability; supply chains; maintenance optimization and reliability; sociotechnical systems; manufacturing of advanced materials; nano- and micromanufacturing; medical devices and biomanufacturing; materials characterization; surface and biointerface engineering; additive manufacturing and reverse engineering; safety engineering; engineering education.

Mechanical Engineering and Materials Science: advanced manufacturing and design; energy and power technology; materials for extreme conditions; soft matter biomechanics; solid and fluid mechanics; computational and data-enabled engineering; smart materials and systems; cyber-physical systems and security; controls; acoustics; nanotechnology; sustainable energies, including nuclear and fuel cells; materials characterization.

Subject matter is guided by current teaching and research. The focus is on original writing and research in all formats, but on occasion reprints of classic works or collected works of major contributors to the field are acquired.

Collection Scope

The Engineering collection offers a wide range of print and digital materials in the form of monographs, journals, selected book series and conference proceedings, compilation of data and properties, and electronic databases related to engineering disciplines. Resources covering methodology, experimental techniques, and instrumentation are acquired, but “one-time use” laboratory manuals, workbooks, and most spiral bound material are not. Advanced and graduate level textbooks may be acquired, but most undergraduate and introductory textbooks will only be acquired on request in support of course reserves. Works of history and philosophy are generally reserved for History and Philosophy of Science but may be acquired selectively. A limited number of more general

or biographical treatments may be acquired to support general interest reading. English is the primary language of the collection. Materials are acquired primarily from publishers based in North America and Europe, but individual works and journals reflect a broad international scope of authors and contributors. The emphasis is on adding current publications.

Technical standards are acquired as part of subscription packages (IEEE, ASTM), depending on relevance, cost, and licensing. Standards that are not otherwise available will be considered for purchase on request by eligible University of Pittsburgh faculty, students, and staff. Preference is given to purchasing formats that can be added to the engineering collection.

Library of Congress Classification

Typical classifications in which materials are acquired are listed below. Selective acquisitions may also be made in other categories based on need and interest. Materials in G, Q, QA, QC, QD, QH, QP, QR, and R are acquired in support of engineering courses and research and in conjunction with what is acquired for computer science, geology, mathematics, statistics, science, and medicine collections. The aspect of sustainability in all areas of engineering is generally of interest.

G (Geography)

- G70-70.6 Methodology *(when Remote Sensing is classified here)*
- GB400-649 Geomorphology
- GB651-2998 Hydrology. Water

HD (Industries. Land use. Labor)

- HD9502-9502.5 Energy Industries. Energy policy. Fuel trade
- HD9715-9717.5 Construction industry. *(e.g., construction management)*

HE (Transportation and communications)

- HE331-380 Traffic engineering. Roads and highways. Streets

Q (Science (General))

- Q300-390 Cybernetics

QA (Mathematics)

- QA75.5-76.95 Electronic computers. Computer science. Computer software
- QA150-699 Algebra, Probabilities, Mathematical Statistics, Analysis, Geometry, Trigonometry, Topology
- QA801-939 Analytic mechanics

QC (Physics)

- QC138-168 Fluids. Fluids mechanics

- QC176 Solids. Solid state physics *(including thin films*)
- QC189 Rheology
- QC251-309 Heat
- QC310-319 Thermodynamics
- QC320-338 Heat transfer
- QC753-761 Magnetism *(and magnetic materials)*

QD (Chemistry)

- QD281 Operations in organic chemistry *(in relation to industry or engineering)*
- QD380-388 Polymers. Macromolecules
- QD503 Chemical Equilibrium. Phase rule, etc.
- QD504-505 Thermodynamics/Catalysis
- QD506-509 Surface chemistry

QH (Natural History (General))

- QH212 Microscopy. Special microscopes *(as in techniques for materials science)*

QH (Biology (General))

- QH323.5 Biometry. Biomathematics. Mathematical models
- QH513 Biomechanics

QP (Physiology) *(e.g., biomechanics and specific organs, senses, or systems of current interest)*

QR (Microbiology) **(***As related to water microbiology, water treatment, and sanitary engineering)*

R (Medicine)

- R856-857 Biomedical engineering. Including Special Topics and Tissue Engineering
- RD130-132 Prosthesis. Artificial organs/Artificial implants and implant materials
- RM950 Rehabilitation technology

T (Technology)

- T55.4-60.8 Industrial Engineering *(including Operations Research)*
- T173.2-178 Technological Change, Research and development.
- T201-385 Patents/Mechanical drawing. Engineering graphics

TA (Engineering (General). Civil Engineering (General))

- TA157-157.5 Engineering as a profession. Engineers *(including ethics and women in engineering)*
- TA164 Bioengineering
- TA165 Engineering instruments, meters, etc. Industrial instrumentation
- TA166-167.5 Human engineering
- TA169.5-169.7 Systems engineering *(including systems reliability, failures, and safety)*
- TA170-171 Environmental engineering
- TA174 Engineering design
- TA177.4-185 Engineering economy
- TA190-194 Management of engineering works
- TA329-348 Engineering mathematics. Engineering analysis
- TA349-359 Mechanics of engineering. Applied mechanics
- TA365-367 Acoustics in engineering. Acoustical engineering
- TA401-492 Materials of engineering and construction
- TA501-625 Surveying *(to the extent that remote sensing is classified here)*
- TA630-695 Structural engineering
- TA703-711.5 Engineering geology. Geotechnical engineering/Soil mechanics
- TA715-788 Earthwork/Foundations
- TA800-820 Tunneling
- TA1001-1285 Transportation engineering
- TA1630-1654 Optical data processing *(including image processing and image analysis)*

TC (Hydraulic Engineering)

- TC160-181 Technical Hydraulics
- TC401-526 River, lake, and water-supply engineering

TD (Environmental Technology. Sanitary Engineering)

- TD159-168.5 Municipal engineering
- TD172-192 Environmental pollution
- TD201-500 Water supply for domestic and industrial purposes
- TD511-812 Sewage collection and disposal systems. Sewerage/Municipal refuse. Solid wastes
- TD878-899 Special types of environment. Soil, air, noise, industrial pollution

TE (Highway Engineering. Roads and Pavements)

- TE195-227 Highway engineering: management, materials, location, construction, maintenance and repair, etc.

- TE250-298 Pavements and paved roads

TG (Bridge engineering) *(as related to current research and teaching)*

TH (Building construction) except generally TH438 (Management of the construction site) *(emphasizing engineering, materials, and sustainability aspects)*

TJ (Mechanical Engineering and Machinery)

- TJ163 Energy conservation
- TJ170-179 Mechanics applied to machinery. Dynamics
- TJ211 Mechanical devices and figures. . . Robots
- TJ212-225 Control engineering systems. Automatic machinery (General)
- TJ241-254 Machinery manufacturing (General)
- TJ255-265 Heat engines. Heat engineering
- TJ266-267.5 Turbines
- TJ751-828 Miscellaneous motors and engines *(including renewable energy sources)*
- TJ840-1030 Hydraulic machinery *(including pneumatic machinery)*
- TJ1040-1119 Machinery exclusive of prime movers *(except TJ1075-1077 Tribology. Lubrication and friction)*

TK (Electrical Engineering. Electronics. Nuclear Engineering)

- TK452-454.4 Electric apparatus and materials *(including electric circuits and networks)*
- TK1001-1841 Production of electric energy or power *(including powerplants)*
- TK2000-2891 Dynamoelectric machinery and auxiliaries
- TK2896-2970 Devices for production of electricity by direct energy conversion
- TK3001-3511 Distribution or transmission of electric power
- TK4125-4399 Electric lighting
- TK5101-6720 Telecommunication
- TK8000-8360 Electronics
- TK9001-9401 Nuclear Engineering
- TL *emphasizing* Motor vehicles. Aeronautics. Astronautics *(selectively, engineering design aspects)*

TN (Mining engineering. Metallurgy)

- TN263-271 Mineral deposits. Metallic ore deposits *(selectively – including Geophysical surveying and Prospecting)*
- TN275-347 Practical mining operations *(selectively-including safety, ventilation, lighting, drainage, mine transportation, etc.)*

- TN400-580 Ore deposits *(selectively)*
- TN600-799 Metallurgy
- TN799.5-948 Nonmetallic Minerals *(primarily Coal, Petroleum, and Natural gas)*

TP (Chemical Technology)

- TP155-156 Chemical engineering
- TP200-248 Chemicals *(manufacture, use, etc. - selectively)*
- TP242.2 Biotechnology
- TP250-261 Industrial Electrochemistry *(selectively)*
- TP267.5-301 Explosives. *(selectively)*
- TP315-360 Fuel
- TP480-498 Low temperature engineering. Cryogenic engineering
- TP690-692 Petroleum refining. Petroleum products
- TP751-762 Gas industry
- TP785-869 Clay industries. Ceramics. Glass *(except Architectural ceramics, ceramic decorations, ornamental glass)*
- TP875-888 Cement industries *(selectively)*
- TP1101-1185 Plastics *(including manufacture)*

TS (Manufactures)

- TS155-194 Production management. Operations management
- TS195-199 Packaging
- TS200-770 Metal Manufactures. Metalworking

Connections & Collaborations

The ULS collaborates with other institutions and consortia to acquire specialized materials that support research, teaching, and learning in the various engineering disciplines, particularly in areas where shared resources improve accessibility to rare or costly materials. Regionally and nationally, the ULS participates in several consortia for collection development (*NERL, EAST, Hathi Trust, CRL*) and resource sharing (PALCI EZBorrow, OCLC Interlibrary Loan, RapidILL) that shape strategy for the Engineering collection. Within the university, the ULS cooperates with the Health Sciences Library System to provide shared access to a variety of electronic books, journals, databases, videos, and specialized resources. Development of the collection takes into account the connection of Engineering with related disciplines, such as biological sciences, business, chemistry, computational science, economics, environmental science, geology, health sciences, materials science, mathematics, physics, and statistics.

Subject Experts

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Sources of Information

- https://www.upb.pitt.edu/academics/majors-minors
- https://www.greensburg.pitt.edu/academics
- https://www.greensburg.pitt.edu/academics/path-pittsburgh-campus/swanson-school-engineering
- https://www.johnstown.pitt.edu/academics/majors-programs
- https://www.titusville.pitt.edu/academics
- https://www.engineering.pitt.edu/