Katz
Katz School
of Science and Health

Addendum of Katz School Graduate Academic Catalog

2025-2026

Yeshiva University Katz School of Science and Health
Beren Campus: 205 Lexington Avenue, 6th Floor, New York, NY 10016
Wilf Campus: Belfer Hall, 2495 Amsterdam Avenue, 13th Floor, New York, NY 10033
Resnick Campus: 1225 Morris Park Avenue and 1165 Morris Park Avenue, Bronx, NY 10461
Phone: 1-646-592-4753
Email: katz@yu.edu

ABOUT THIS CATALOG

Unless otherwise stated in this document, this catalog supersedes all previous catalogs and academic information and policies and is binding on all Katz School of Science and Health graduate students at Yeshiva University, effective at the time they enroll. It was prepared based on the best information available at the time of publication. The University reserves the right to change tuition, fees, course offerings, regulations, policies, and admission and graduation requirements at any time without prior notice. However, students may continue a course of study in effect at the time they enrolled provided that they complete the program within the specified time period.

This catalog, posted on the YU website, is the official catalog. Printed versions are copies of the catalog. If there are corrections or changes, they will be published on the YU website.

TABLE OF CONTENTS

- Plagiarism
- Penalties and Procedures for Violating Academic Integrity Standards
- Notification Process
- Initial Review
- Hearing
- Decision
- Appeal
- Records
- Readmission after Dismissal
- Other Violation of Academic Integrity

SOCIAL MEDIA USE

- YU Student Technology Resources Use Handbook

GRIEVANCES

- Grievance Procedure

HEALTH REQUIREMENTS

- COVID Policy
- Immunization Forms
- Health Science Student Onboarding

STUDENT LIFE AND RESOURCES

- Student Services
- Academic Advisement
- Canvas
- Career Center
- Counseling Center
- Disability Services
- English for Graduate School and Work
- Graduate Assistantships
- Health Services
- Housing and the Transition to New York
- Library Services
- New Student Orientation
- New York City Experience
- Office of International Students and Scholars
- Office of Student Finance
- OneCard
- Parking for Student and Alumni
- Research Opportunities
- Scholarships
- Shuttle Transportation
- Student Organizations and Clubs

PROGRAM DESCRIPTIONS: STEM

- MS in Artificial Intelligence
- MS in Biotechnology Management and Entrepreneurship
- MS in Computer Science
- MS in Cybersecurity
- PhD in Computer Science
- MS in Data Analytics and Visualization
- MS in Digital Marketing and Media

- MA in Mathematics
- PhD in Mathematics
- MA in Physics
- MS in Quantitative Economics
- MS in Quantitative Finance

PROGRAM DESCRIPTIONS: HEALTH SCIENCES

- OTD in Occupational Therapy
- MS in Physician Assistant Studies
- MS in Speech Language Pathology

Katz School of Science and Health

WELCOME TO KATZ SCHOOL

The Mordecai D. and Monique C. Katz School of Science and Health at Yeshiva University (Katz School) gives students the opportunity to further their intellectual and professional pursuits and become a part of one of U.S. News and World Report's top 100 universities in the United States. Katz School is committed to delivering a world-class education in emerging and expanding disciplines, to connecting students with thought-leaders and employers in New York City and beyond, and to creating an exemplary student and faculty experience.

Our programs focus on Applied Sciences and Mathematics; Technology, Data, and Design; Health Sciences; and those emerging and expanding professions that are being transformed by technology innovations. Graduate students can earn master's degrees in Artificial Intelligence, Biotechnology Management and Entrepreneurship, Computer Science, Cybersecurity, Data Analytics and Visualization, Digital Marketing and Media, Mathematics, Physician's Assistant Studies, Quantitative Economics, or Speech- Language Pathology, and doctoral degrees in Computer Science, Mathematics and Occupational Therapy. In each of these highly specialized programs, the curriculum is informed by industry, providing our graduates with tools that will serve them well into their careers.

An Exceptional Education

Whether on campus or online, courses are taught by an exceptional group of faculty, each committed to the principles of quality instruction. Unlike many professionally oriented schools, the faculty endeavor to teach the science and strategies behind the skills, so that students can have a knowledge base that will help them to thrive long after graduation.

Rather than relying on tests and exams, courses are frequently project based, so that students are evaluated on what they build and do. As a result, students graduate with a portfolio of work that will give them a competitive edge in the job market. Faculty also recognize the critical role of technology in enabling digitally connected and data-rich organizations and therefore incorporate the latest software and lab equipment into their courses.

An Experience that Matters

We challenge each of our students and faculty to lead with values—kindness, honesty, generosity, integrity, and justice towards others—and to leave the world a little better than they found it. We are committed to the belief that it is not only the destination that counts but the values we bring to the journey.

Paul Russo
Vice Provost and Dean, Katz School of Science & Health

Program Codes

All programs are registered by the New York State Education Department and meet its educational requirements.

HEGIS Code	CIP Code	Title	Degree
1701.00	27.0304	MA and PhD in Mathematics	Master of Arts (STEM)
1902.00	27.0103	MA in Physics	Master of Arts (STEM)
0701.00	11.0102	MS in Artificial Intelligence	Master of Science (STEM)
0499.00	51.0720	MS in Biotechnology Management and Entrepreneurship	Master of Science (STEM)
0701.00	11.0701	MS and PhD in Computer Science	Master of Science (STEM)
0701.00	11.1003	MS in Cybersecurity	Master of Science (STEM)
0702.00	30.7101	MS in Data Analytics and Visualization	Master of Science (STEM)
1208.00	51.2306	Occupational Therapy Doctorate	Doctorate in Occupational Therapy (HEALTH)
1299.10	60.0902	MS in Physician Assistant Studies	Master of Science (HEALTH)
1220.00	51.0203	MS in Speech-Language Pathology	Master of Science (HEALTH)
1208.00	51.2306	Occupational Therapy Doctorate	Doctorate in Occupational Therapy (HEALTH)

PROGRAM DESCRIPTIONS

PhD in Computer Science

Program Director

- Honggang Wang, Ph.D. - Professor and Department Chair, Graduate Computer Science and Engineering

Curriculum and Degree Requirements

The PhD in Computer Science is designed to cultivate a new generation of STEM researchers who will advance computer science theory and applications in both academia and industry, helping to fill a nation-wide shortage of doctorally-qualified, ethically grounded computer scientists. The program serves as an intellectual home within Yeshiva University and the field, fostering a culture of innovative, interdisciplinary research and contributing to the advancement of critical technologies in fields like healthcare, climate, energy, finance and security.

The curriculum trains students in the depth and breadth of computer science, as well research methods and emerging research necessary for careers in university or industry R&D. Other unique program features include:

Interdisciplinary Research: Students will conduct interdisciplinary research and may work with faculty from across YU on their committees.

Future University Faculty: All students must complete a teacher training program and teach at least one graduate course under the mentorship of a faculty member and instructional designer.

Industry R&D: Students may request approval to work on industry-sponsored projects and include doctorally-qualified industry practitioners on committees, if there are no publishing restrictions.

The program is committed to providing access for promising scientists who align with Yeshiva University's values and mission, and who are dedicated to making the world smarter, safer, and healthier. It prepares students for careers as computer science faculty in higher education or as researchers in industry R&D. Through a focus on interdisciplinary and applied research, the program fosters the development of cutting-edge innovations that address real-world challenges.

Requirements (66 credits)

To earn a PhD in Computer Science, students must complete 66 graduate credits, with a minimum of 36 credits at the 6000 level or above. The remaining 30 credits may be transferred from an accredited institution or drawn from relevant graduate courses at YU, with advisor approval.

Breadth Courses (30 credits)

It is expected that entrants will have a related master's that includes prior computer science coursework in the following areas: advanced algorithms, emerging programming paradigms, theoretical computer science, AI/ML, and computer systems. If any of these areas were not covered or not covered within the last five years, equivalent graduate courses may be taken at the Katz School.

Sample Course Sequence (Full Time)

Fall 1	Spring 1
COM 6002 Distributed Systems (3 cr.)	COM 6004 Networking (3 cr.)
COM 6003 Databases (3 cr.)	COM 6014 Generative AI (3 cr.)
COM 6010 Reinforcement Learning (3 cr.)	COM 6005 Computer Vision (3 cr.)
COM 6006 Research Methods (3 cr.)	COM 6011 Applications of Medical AI (3 cr.)
COM Research Seminar (1 cr.)	COM 6007 Research Seminar (1 cr.)
Term Credit Total: 13	**Term Credit Total: 13**

Fall 2
COM 7000 Dissertation (6 cr.)
COM 6007 Research Seminar (1 cr.)
COM 6007 Research Seminar (1 cr.)
COM 6007 Research Seminar (1 cr.)
COM 6007 Research Seminar (1 cr.)
Term Credit Total: 10
Total Credits: 66 (including 30 credits from master's degree)

Course Descriptions

COM 6002 Distributed Systems, Credits: 3
COM 6003 Databases, Credits: 3
COM 6004 Networking, Credits: 3
COM 6005 Computer Vision, Credits: 3
COM 6006 Research Methods in Computer Science, Credits: 3
COM 6007 Research Seminar, Credits: 1
COM 6010 Reinforcement Learning, Credits: 3
COM 6011 Application of Medical AI, Credits: 3
COM 6012 Robotics, Credits: 3
COM 6013 Quantum Computing, Credits: 3
COM 6014 Generative AI, Credits: 3
COM 6020 Special Topics, Credits: 3
COM 6021 Independent Study, Credits: 3
COM 6022 Internship, Credits: 3
COM 7000 Dissertation, Credits: 3

Course Descriptions

COM 6002 Distributed Systems
Distributed systems refers to the way in which several machines orchestrate to correctly solve problems in an efficient, reliable and scalable way. These systems underpin the design and implementation of scalable, fault-tolerant, and high-performance systems that drive modern computing infrastructures. This course will enable students to develop a solid understanding of the principles and techniques underlying distributed system design and will provide hands-on opportunities to design, implement, and debug real-world distributed systems. Key topics include process distribution, communication, naming, abstraction and modularity, concurrency, scheduling, resource sharing, locking, consistency and replication, failure handling, distributed programming models, distributed file systems, and virtualization.

COM 6003 Databases
Databases enable the efficient storage, retrieval, and management of vast amounts of structured and unstructured data, supporting critical applications in fields such as big data analytics, artificial intelligence, and enterprise systems. This course provides a comprehensive understanding of advanced database concepts, with a focus on the design and implementation of database management systems. Topics include data models (relational, document, key/value), storage models (n-ary, decomposition), query languages (SQL, stored procedures), storage architectures (heaps, log-structured), indexing (order preserving trees, hash tables), transaction processing (ACID, concurrency control), recovery (logging, checkpoints), query processing (joins, sorting, aggregation, optimization), and parallel architectures (multi-core, distributed).

COM 6004 Networking
Networking enables seamless communication, data exchange, and resource sharing across interconnected systems, forming the foundation for the internet, cloud computing, and modern distributed applications. This course offers a comprehensive introduction to computer networking, beginning with the evolution of internet architecture, and explores advanced principles, architectures, and protocols that enable efficient and secure communication in modern networks. Topics include key protocols and algorithms across all layers of the internet stack, including TCP, congestion control, and

both intradomain and interdomain routing. Students will explore network design, interconnection agreements, and the economic dynamics of networking, followed by discussions on router architecture, Software-Defined Networking (SDN), and modern network management.

COM 6005 Computer Vision

Computer vision is a vital field in computer science that enables machines to interpret and understand visual data, driving advancements in artificial intelligence, autonomous systems, medical imaging, and numerous real-world applications. This course focuses on fundamental concepts and advanced topics in image analysis and computer vision. Topics include image formation, image filtering, edge detection, image classification/segmentation/regression, convolution neural network, deep learning, objection detection, and semantic segmentation.

COM 6006 Research Methods in Computer Science

This course equips students with essential methodologies, critical thinking skills and best practices for conducting rigorous, reproducible and impactful research in the field. The course provides an in-depth exploration of CS research methodologies and covers fundamental principles of scientific inquiry, research design, experimentation and evaluation. Topics include literature review strategies, quantitative and qualitative methods, data analysis, ethical considerations, and effective communication of research findings.

COM 6007 Research Seminar

A cornerstone of the PhD in Computer Science, the research seminar provides students with an opportunity to engage with current research topics, emerging trends, and challenges in computer science and related disciplines. Each seminar will feature invited speakers from academia, industry, or research labs who are working on cutting-edge CS research. Students will also present their own research progress and have the opportunity to receive feedback from peers. Through the course, students will gain exposure to a range of research topics and methodologies; explore collaborative and interdisciplinary research opportunities; engage in critical analysis of existing research; receive guidance on writing and preparing submissions for conferences or journals, including the ethics of publishing, handling peer review, and dealing with revisions; and gain exposure to networking and career opportunities in academia and industry.

COM 6010 Reinforcement Learning

Reinforcement learning is a key area of artificial intelligence that enables agents to learn optimal decision making strategies through interaction with their environment, with significant applications in robotics, game playing, autonomous systems, and real-world optimization problems. Bridging theory and practice, this course will prepare students for hands-on skills in deep reinforcement learning with Python and the advanced framework PyTorch. Key topics include PyTorch, Cross-Entropy Method, MDP and Bellman Equations, Q-Learning, Deep Q-Networks, Policy Gradient Methods and Continuous Action Space.

COM 6011 Application of Medical AI

Medical AI is a transformative field that leverages artificial intelligence to enhance medical diagnosis, treatment planning, and healthcare management. This course explores the cutting-edge applications of AI in the medical and healthcare sectors. Topics include medical imaging analysis, predictive analytics, natural language processing for clinical data, AI-driven diagnostics, and ethical considerations in AI-assisted healthcare. Students will engage with real-world datasets, implement AI models, and critically evaluate the effectiveness of AI in clinical decision-making. The course aims to equip students with the theoretical knowledge and practical skills necessary to conduct independent research and contribute to advancements in Medical AI. Prerequisite(s): COM 5100.

COM 6012 Robotics

Robotics is a pivotal field in computer science and engineering that integrates artificial intelligence, control systems, and sensing technologies to develop autonomous and intelligent machines, with applications spanning healthcare, manufacturing, space exploration and everyday life. This course provides an in-depth exploration of robotics, focusing on fundamental principles, advanced theories, and state-of-the-art research in robot perception, motion planning, control, and learning. The course emphasizes both theoretical and experimental aspects, and students will critically analyze recent advancements and contribute novel ideas to the field of robotics through cutting-edge research. Topics include

kinematics, dynamics, control architectures, robotic sensing, AI-based robot decision-making, and human-robot interaction.

COM 6013 Quantum Computing

Quantum Computing is a groundbreaking field that harnesses the principles of quantum mechanics to solve complex problems in cryptography, optimization and simulation, offering the potential to revolutionize computation and address challenges beyond the capabilities of classical computers. This course introduces students to the fundamental concepts of quantum computing and prepares them to engage with the latest advancements in the field. The course covers both the theoretical and practical aspects of quantum computing, including the mathematical foundations necessary to describe quantum systems and the algorithms that offer exponential speedups compared to classical methods. Key topics include qubits and quantum gates, quantum fourier transform, advanced quantum algorithms, quantum computing hardware, and quantum machine learning.

COM 6014 Generative AI

Generative AI is a transformative technology that enables machines to create new content, such as text, images, and music, driving innovation in fields like entertainment, design, healthcare, and artificial intelligence, while reshaping creative processes and human-computer interaction. This course covers foundational concepts and advanced methods in generative AI, beginning with simple models to build essential deep learning skills using PyTorch. Course topics include autoregressive models with LSTM, GANs, VAEs, RNNs, attention and transformer, GPT, and knowledge distillation of large language models. Prerequisite(s): AIM 5007.

COM 6020 Topics in Computer Science

This course provides the opportunity to offer special interest courses on emerging theory, phenomena, and technologies in computer science, in areas such as systems, human-computer interaction, machine learning, and artificial intelligence. This will be an advanced class, whether seminar style or project based. Students are required to complete an appropriate project or other deliverable in line with the number of credits awarded for the course. Prerequisite(s): Permission of the Program Director.

COM 6021 Independent Study

The course will allow students to explore specialized research topics under faculty guidance, fostering critical thinking, self-directed learning, and advanced problem-solving skills. This course provides the student with the flexibility to learn more about a topic of interest outside of the formal course setting. Topics will cover literature review, gap analysis, experimental design, implementation, scientific writing and presentation. The subject should be chosen in consultation with a faculty advisor who acts as the student's supervisor, and with the permission of the program director.

COM 6022 Internship

This course allows students to participate in an off-campus internship supervised by a staff person at the internship site and overseen by a faculty advisor. The internship site must be approved by the program director and the overall duration of student work must be no less than 150 hours (based on a 3-credit course). At the start of the internship, the student and faculty advisor will jointly develop specific learning objectives tailored to the nature of the internship. Over the course of the internship, students will be required to submit weekly reflections, and at the end of the internship, students write a final paper that represents the culmination of the work. Prerequisite(s): Permission of the Program Director.

COM 7000 Dissertation

The Dissertation in Computer Science is the final project of a doctoral candidate's research, aimed at making an original contribution to the field. This dissertation is a significant, independent research undertaking that demonstrates the candidate's ability to conduct thorough scientific research, tackle complex problems, and provide new insights into computer science. The research should contribute to advancing knowledge, addressing important challenges, or exploring new areas within computer science. The dissertation course will focus on topic selection and proposal development, research and data collection, writing the dissertation, and the final dissertation defense.

Admissions Requirements

Prerequisite coursework/academic background:

A master's degree in computer science or a related field from an accredited institution with a minimum GPA of 3.3 on a 4.0 scale. Exceptions may be made with permission from the program director. Qualified candidates who do not have a master's degree in a related field may begin in one of our master's programs, such as Computer Science, Artificial Intelligence, Data Analytics and Mathematics).

Demonstrated research experience (e.g., publications, undergraduate research, thesis, and/or research projects) is highly desirable but not strictly required.

English proficiency for international students (refer to Katz Admissions page):

All applicants to Katz School STEM master's programs submit the following:

- Completed online application
- US$50 non-refundable application fee
- Supporting documents, including:
    - Transcripts from all colleges and universities attended
    - Statement of purpose
    - Resume
    - Proof of English proficiency (if you are an international student, refer to Katz Admissions page)
    - Recommendation letters (required for MA in Mathematics, Physics programs and PhD in Computer Science only, excluding statistics)
        - Three (3) Recommendation letters are required for the PhD in Computer Science program; at least one (1) should specifically address the applicant's research experience and potential.
    - GRE and/or GMAT scores (required for Math and Computer Science Ph.D. only)