Wentworth
Co-ops & Careers

Technical Competencies and Professional Skills

Applied Mathematics

Technical Skills: data visualization and analysis, SQL, finance and accounting

Programming Languages: R, MATLAB, C++, Java, Python

Markup Languages: LaTeX, HTML, CSS Software: Microsoft Office (Excel, Office, Word), XCode, Visual Studio

Note: *Skills, software, and languages are dependent on elective taken, computer selection, and class year.*

Applied Sciences

Instrumentation: UV/Vis spectroscopy, NMR spectroscopy, IR spectroscopy, GC-MS, LC-MS, thermocycler, nucleic acid sequencer, microplate reader, cryocooler

Lab Techniques: Gel electrophoresis and SDS-PAGE, Western blotting, primer design and Polymerase Chain

Reaction (PCR), QPCR, sterile lab technique, cell culture, nucleic acid isolation and purification, protein isolation and purification (chromatography, centrifugation, dialysis), enzyme thermodynamics and kinetics, transfection and transformation, chemical synthesis and purification (distillation, extraction, chromatography, rotary evaporator, crystallization), inert atmosphere and Schlenk line techniques, titration, dissection of preserved specimens, four-probe electrical measurement, Bragg diffraction

Competencies: Application of the scientific method, Scientific writing and oral communication Software and computational skills: Microsoft Office (Word, Excel, Powerpoint), ChemDraw, PyMol, TopSpin, Java, Protein DataBank (PDB), NCBI suite (including BLAST, GenBank), Orca Quantum Chemistry software, LoggerPro, LabView

Architecture

Design Skills: Multi-scale civic and institutional projects (educational facilities, museums, theaters, libraries, etc.), mixed use projects, multi-unit housing and urban design.

Building Technology and Systems Knowledge: Building materials and assemblies, structures, environmental systems, sustainable design, site planning and landscape and contract documents

Digital Skills: 2D drawing & 3D modeling using AutoCAD, Revit, Rhino 3D, ArchiCAD, Sketchup. Rendering using Maxwell, V-Ray and Artlantis. Image editing and formatting using Photoshop, InDesign, Illustrator. Daylighting and energy analysis using Ecotect

Biological Engineering

Technical Skills: Nucleic Acid isolation and purification, protein and nucleic acid electrophoresis, protein biochemistry, cell culture, husbandry and culture of model organisms, western blotting, primer design & Polymerase Chain Reaction (standard and RT), process control, bioreactor operation, mass transfer principles, genetic cloning, transfection and transformation, enzyme thermodynamics and kinetics.

Software: MATLAB, Microsoft Office (Word, Excel, PowerPoint), Google Apps

Soft Skills: Scientific writing and oral communication.

Design Skills: Application of the scientific method to design experiments and conduct research projects; application of engineering design principles to approach engineering problems.

Biomedical Engineering

Technical Skills: Analog and digital circuits, breadboard/data acquisition board

Software: MATLAB, LabVIEW, Multisim, C++, SolidWorks, AutoCAD, Microsoft Office, Google Apps

Test Instruments & Devices: Oscilloscope, function generator, multimeter, power supply, TI MSP430 microcontroller, strain gauge

Medical Devices: Vernier sensors, including EMG, EKG/ECG, pulse oximeter, blood pressure cuff

Business Management

Technical Skills: Microsoft Office (Access, Excel, Project, PowerPoint), decision tools, systems analysis and design

Professional Skills: Email etiquette, project management, team processes, leadership, negotiations, analytical decision making, operations

Civil Engineering, Civil Engineering Technology

Design: AutoCAD, AutoCAD Civil 3D, RISA 2D

Field: Total station, theodolite, automatic level

Microsoft: Microsoft Office (Excel, Word, PowerPoint)

Computer Engineering, Computer Engineering Technology

Technical Skills: Analog and digital circuit design, building and testing, reading schematics, software development and testing, debugging of software, hardware, and interface

Operating Systems: Windows, Linux/Unix

Software: AutoCAD, PSpice, Agilent VEE, LabVIEW, Quartus II, Multisim, Microsoft Office (Excel, Word, PowerPoint), Wireshark, Eclipse, Cadence, Visual Studio

Programming Languages: C, C++, Verilog, MATLAB, Assembly, Python, SQL

Test Instruments: Oscilloscope, function generator, digital multimeter, power supply, Waveform Generator Breadboard

Devices: Nios II soft microprocessor, Texas Instrument MSP430, FPGA Altera's Max V, Max10, BJT's, OP-Amps (741), TTL, CMOS, Arduino, STM32

Wentworth
Co-ops & Careers

Computer Information Systems

Technical Skills: MS Office (Excel, Access, Project, Teams), programming, decision tools, systems analysis and design, troubleshooting software, hardware, and systems

Management Skills: Project management, email etiquette, team processes, leadership, analytical decision making, operations

Operating Systems: Windows, Linux/Unix

Programming Languages: Java, Python, SQL

Note: *Every student would add skills based on their concentration*

Computer Networking

Operating Systems: Linux, Windows, Windows Server, Kali Software: Cisco IOS, VMware Workstation, VirtualBox, Wireshark Oracle

Programming Languages: Java, Shell, SQL, HTML, JavaScript, PHP

Note: *Every student would add to the lists based on the electives they've taken*

Computer Science

Programming Languages: Java, C, C++, SQL, Assembly, R

Software: Visual Studio, Eclipse, MySQL, Oracle, VirtualBox, Office Operating

Systems: Windows, Linux

Note: *Every student would add to the lists based on the electives they've taken*

Construction Management

Technical Skills: Sage Timber line, and Microsoft Project

Management: Primavera P6, Prolog, On-Center

Design: AutoCAD, Revit

Field: Total station, theodolite, automatic level

Microsoft: Word, Excel, PowerPoint

Computer Management

Technical Skills: Sage Timber line, and Microsoft Project

Management: Primavera P6, Prolog, On-Center

Design: AutoCAD, Revit

Field: Total station, theodolite, automatic level

Microsoft: Word, Excel, PowerPoint

Cybersecurity

Network Software: Cisco Packet Tracer, Nmap, Maltego, SGLite Browser, Wireshark, Network Miner Forensic & Security Software: Microsoft Baseline Security Analyzer, Cain, Lophtcrack, Autopsy, Volatility

Programming Languages: Java, C, C++, SQL, Bash Scripting

Software: Visual Studio, Eclipse, REDCap, Adobe Creative Suite

Hardware: Workstations, servers, desktops, KVM's, Raspberry Pi, Network hardware

Operating Systems: Ubuntu/Debian/CentOS/Arch Linux, Windows 8/10, MacOS

Electrical Engineering, Electronic Engineering Technology

Technical Skills: Analog and digital circuit design, building and testing, reading schematics, electric machines and transformers, 3-phase systems, power factor correction

Operating Systems: Windows XP, Windows 8

Software: AutoCAD, PSpice, Agilent VEE, LabVIEW, Quartus II, Multisim, Cadence, Microsoft Office (Word, Excel, PowerPoint)

Programming Languages: C, C++, VHDL, MATLAB

Test Instruments: Oscilloscope, function generator, digital multimeter, power supply

Devices: Texas Instrument MSP430, FPGA Altera's Cyclone II, TTL, CMOS, operational amplifiers

Electromechanical Engineering

Technical Skills: Machining, CNC operation, strength testing, casting, welding, analog and digital circuit design Texas Instrument MSP430, FPGA Altera's Cyclone II,

Design: AutoCAD, SolidWorks, Mechanical Desktop, technical drawings

Software: MATLAB, Simulink, Working Model (2-D), PSpice, Agilent VEE, LabVIEW, Quartus II, Multisim, Microsoft Office (Excel, Word, PowerPoint)

Programming Languages: C, C++, VHDL

Test Instruments: Oscilloscope, function generator, digital multimeter, power supply, micrometer, dial bore gauge, Arduino

Facility Planning and Management

Technical Skills: building structure, environmental systems, construction documentation, lighting, building regulations, project management, energy management, building assessment

Software: AutoCAD, Revit, InDesign, Illustrator, Photoshop, Google Sketchup, Microsoft Office (Word, Excel, PowerPoint), Microsoft Project

Management Skills: Presentation skills, project development, financial analysis, benchmarking

Industrial Design

Design Process and Visualization: Ideation, Concept Sketching and Product Illustration (digital), 3D Fabrication—Formstorming to Prototyping, Design Research, Graphic Design, Data Visualization, Photography

Software: SolidWorks, Rhino 3D, KeyShot, Adobe Creative Cloud (Photoshop, Illustrator, InDesign), Sketchbook, Procreate, Microsoft Office

Fabrication Skills: Traditional fabrication techniques in wood, metal and plastic. Digital fabrication techniques in additive manufacturing.

Interdisciplinary Engineering

See major concentration for more details.

Interior Design

Design Project Types: Retail, hospitality, residential, corporate

Technical Knowledge: Building structure, materials selection and specification, environmental systems, furniture selection and specification, construction documentation, lighting, building regulations, sustainability

Digital Skills: AutoCAD, Sketchup, Podium, Revit, Photoshop, Illustrator, InDesign, Microsoft Office (Word, PowerPoint, Excel)

Mechanical Engineering, Mechanical Engineering Technology

Engineering: Materials testing, flow devices, strain gauges, welding, casting, Tinius Olsen impact tester, FEA,

Engineering Graphics, Machine Design, Thermal Analysis, Materials testing with Instron Equipment, Simulation

Based Design, Finite Element Analysis (FEA)

Software: BASIC Programming, C++, SolidWorks, SolidWorks Simulation FEA, Mechanical Graphics, AutoCAD, Mechanical Desktop 6, Working Model 2D, MATLAB, Microsoft Office (Word, Excel, Outlook, Access, PowerPoint)

Manufacturing: CAMWorks, G programming language (G-code), Document management systems (Agile), enterprise resource planning (Chess), manufacturing execution systems (DataSweep MES), CNC milling on 3 axes.