Cavalla International University

COURSE PROGRAM STRUCTURE/STUDENT CHECKLIST

PROGRAM OF STUDY: ☐ BS in Cybersecurity; ☐ BS in Computer Science; ☐ BS in Computer Engineering; ☐ BA and BS in Electrical Engineering; ☐ Combined BS/MS in Computer Engineering; ; ☐ Combined BS/MS in Electrical Engineering; ☐ BS in Artificial Intelligence Engineering; ☐ BS in AI Software and Systems Engineering; ☐ BS in Data Science; ☐ BS in Data Engineering; ☐ BS in Biomedical Engineering; ☐ BS in Bioengineering Innovation and Design; ☐ BS in Chemical and Biomolecular Engineering; ☐ BS in Civil and Systems Engineering; ☐ BS in Materials Science and Engineering; ☐ Combined BS/MS in Materials Science and Engineering; ☐ BS in Mechanical and Systems Engineering; ☐ BS in Mechanical and Software Engineering

The degree typically takes 4-5 years to complete. However, students enrolled in the accelerated option can complete the bachelor's degree within 3-4 years. Students with 2 years of previous college credits, and students who possess professional educational backgrounds with diplomas in their field studies can complete the bachelor's degree program within 2 – 2 ½ years. **Bachelor's Degree Completion: 3-4 years accelerated program. Bachelor's Degree Specialized completion program – 18 Months – 2 years.** Students admitted to the bachelor's degree program can enroll in the 8 weeks accelerated semester or in the regular 12 weeks semester, and they can take up 9 credits during each semester. **128 credit hours are required for completion**. General Education: 64 credit hours; Required Core Courses: 28; Required and Specialized Electives: 30; Research Project: 6.

BACHELOR OF ARTS/SCIENCE (BA/BS) PROGRAM FIRST YEAR (CORE COURSES)			
Course No.	Course	Credit(s)	Grade
ORI 101	Freshman Orientation	1	
RED 101	College Reading	3	
ALG 101	Elementary Algebra	3	
ENG 101	English Composition I	3	
HLTH 101	Personal Health	3	
Total		**13**	

BACHELOR OF ARTS/SCIENCE (BA/BS) PROGRAM SECOND YEAR (CORE COURSES)			
Course No.	Course	Credit(s)	Grade
ENG 102	English Composition II	3	
TECH 102	Technology Fluency	3	
ALG 102	College Algebra	3	
SPC 102	Introduction to Speech Communication	3	
Total		**12**	

BACHELOR OF ARTS/SCIENCE (BA/BS) PROGRAM – THIRD YEAR (CORE/REQUIRED & SPECIALIZED COURSES)			
Course No.	Course	Credit(s)	Grade
SOC 101	Introduction to Social Sciences	3	
MGT 102	Management Concepts	3	
ECO 103	Introduction to Economics	3	
HIST 104	U.S. & World History	3	

BACHELOR OF SCIENCE (BS/MS) PROGRAM – Computer Engineering			
Course No.	Course	Credit(s)	Grade
BCE 200	Introduction to Computer Engineering	3	
BCE 201	Introduction to Engineering Design	3	
BCE 202	Introduction to Electrical & Computer Engineering	3	
BCE 203	Disciplinary Foundation of Computer Engineering	3	
BCE 204	Professional Writing	3	
BCE 205	Computer Science Theory and Applications	3	
BCE 206	Artificial Intelligence Engineering	3	
BCE 207	Organization of Programming Languages	3	
BCE 208	Algorithms	3	
BCE 209	Operating Systems	3	
BCE 210	Digital Computer Design	3	
BCE 211	Software Engineering Requirements	3	
BCE 212	Systems Engineering Requirements	3	

Note: The University encourages students to engage in their third year in a capstone learning experience: advanced seminars, clinical practice, and writing projects that call on students to use the full extent of their knowledge, skills, and methodological tools in a field to address the most interesting and complicated legal problems of today.

Total		12	

BACHELOR OF ARTS/SCIENCE (BA/BS) PROGRAM – FOURTH YEAR (REQUIRED & SPECIALIZED COURSES)			
Course No.	**Course**	**Credit(s)**	**Grade**
	Required & Specialized Electives	3	
	Required & Specialized Electives	3	
	Required & Specialized Electives	3	
	Required & Specialized Electives	3	
	Required & Specialized Electives	3	
Total		**15**	

BACHELOR OF ARTS/SCIENCE (BA/BS) PROGRAM (REQUIRED & SPECIALIZED COURSES)			
Course No.	**Course**	**Credit(s)**	**Grade**
	Required & Specialized Electives	3	
	Required & Specialized Electives	3	
	Research Project	6	
Total		**12**	

BACHELOR OF SCIENCE (BA/BS/MS) PROGRAM – Electrical Engineering			
Third year Students may elect to take any of the courses below or take additional courses from the courses listed below. Interested students should confer with their mentors before making such decision.			
Course No.	**Course**	**Credit(s)**	**Grade**
BEE 217	Introduction to Electrical Engineering	3	
BEE 218	Project Engineering Management	3	
BEE 219	Electric Circuits	3	
BEE 220	Digital Logic Design	3	
BEE 221	Elements of Discrete Signal Analysis	3	
BEE 222	Software Engineering Requirements	3	
BEE 223	Systems Engineering Requirements	3	
BEE 224	Applied Probability & Statistics	3	
BEE 225	Artificial Intelligence Electrical Engineering	3	
BEE 226	Leadership in Electric Engineering	3	
BEE 227	Electrical Engineering Theory and Applications	3	
BEE 228	Communications and Signal Processing	3	
BEE 229	Computer Engineering	3	
BEE 230	Electrophysics and Controls	3	
BEE 231	Microelectronics and Power Systems	3	

BACHELOR OF SCIENCE (BS) PROGRAM – Cybersecurity			
Third year Students may elect to take any of the courses below or take additional courses from the courses listed below. Interested students should confer with their mentors before making such decision.			
Course No.	**Course**	**Credit(s)**	**Grade**
BCY 237	Introduction to Cybersecurity	3	
BCY 238	Applied Probability & Statistics	3	
BCY 239	Operating Systems Fundamentals	3	
BCY 240	Introduction to Networking	3	
BCY 241	Cyber Threat Intelligence	3	
BCY 242	Network Defense	3	
BCY 243	Cybersecurity Planning & Policy	3	
BCY 244	Security Audit & Assessments	3	
BCY 245	Operating System Security	3	
BCY 246	Introduction to Digital Forensics	3	
BCY 247	Network Administration	3	
BCY 248	Data/Database Security	3	

BACHELOR OF SCIENCE (BS) PROGRAM – Artificial Intelligence Engineering			
Third year Students may elect to take any of the courses below or take additional courses from the courses listed below. Interested students should confer with their mentors before making such decision.			
Course No.	**Course**	**Credit(s)**	**Grade**
AIE 227	Introduction to Artificial Intelligence Engineering	3	
AIE 228	Introduction to AI: Representation and Problem Solving	3	
AIE 229	Artificial Intelligence for Leaders & Managers	3	
AIE 230	Artificial Intelligence in Organizations	3	
AIE 231	Introduction to Machine Learning	3	
AIE 232	Artificial Intelligence & Data Management	3	
AIE 233	Software and Systems Engineering	3	
AIE 234	Advanced Systems Analysis and Design	3	
AIE 235	Human-Robot Interaction	3	
AIE 236	Human-AI Interaction	3	
AIE 237	Designing Human-Centered Software	3	
AIE 238	Design of Artificial Intelligence Products	3	

BACHELOR OF SCIENCE (BS) PROGRAM – AI Software & Systems Engineering

Third year Students may elect to take any of the courses below or take additional courses from the courses listed below. Interested students should confer with their mentors before making such decision.

Course No.	Course	Credit(s)	Grade
SSE 207	Introduction to AI Software & Systems Engineering	3	
SSE 208	Artificial Intelligence for Leaders & Managers	3	
SSE 209	Artificial Intelligence in Organizations	3	
SSE 210	Introduction to Machine Learning Engineering	3	
SSE 211	Artificial Intelligence & Data Management	3	
SSE 212	Software and Systems Engineering	3	
SSE 213	Advanced Systems Analysis and Design	3	
SSE 214	Human-Robot Interaction Engineering	3	
SSE 215	Human-AI Interaction Engineering	3	
SSE 216	Designing Human-Centered Software	3	
SSE 217	Artificial Intelligence and Humanity	3	
SSE 218	Deep Learning Systems: Algorithms and Implementation	3	
SSE 219	Foundations of Learning, Game Theory, and Their Connections	3	

BACHELOR OF SCIENCE (BS) PROGRAM – Computer Science

Third year Students may elect to take any of the courses below or take additional courses from the courses listed below. Interested students should confer with their mentors before making such decision.

Course No.	Course	Credit(s)	Grade
BCS 249	Introduction to Computer Science	3	
BCS 250	Applied Probability & Statistics	3	
BCS 251	Programming in C++	3	
BCS 252	Programming in Java	3	
BCS 253	Computer Architecture	3	
BCS 254	Operating Systems Theory & Design	3	
BCS 255	Computer Ethics	3	
BCS 256	Artificial Intelligence	3	
BCS 257	Systems Analysis & Integration	3	
BCS 258	Security Technology	3	
BCS 259	Web Development & Design	3	
BCS 260	Software & Systems Engineering	3	
BCS 261	Software Testing & Automation	3	
BCS 262	Data Structures and Algorithms	3	

BACHELOR OF SCIENCE (BS) PROGRAM – Data Engineering

Third year Students may elect to take any of the courses below or take additional courses from the courses listed below. Interested students should confer with their mentors before making such decision.

Course No.	Course	Credit(s)	Grade
BDE 207	Introduction to Data Engineering	3	
BDE 208	Introduction to Programming in Python	3	
BDE 209	Scripting and Programming - Foundations	3	
BDE 210	Software and Systems Engineering	3	
BDE 211	Data Analytics - Applications	3	
BDE 212	Data Management - Foundations	3	
BDE 213	Data Management - Applications	3	
BDE 214	Advanced Data Engineering	3	
BDE 215	Leadership in Data Engineering Management	3	
BDE 216	Scripting and Programming - Applications	3	
BDE 217	Hardware and Operating Systems	3	
BDE 218	Web Development & Cloud Foundations	3	
BDE 219	Fundamentals of Spreadsheets and Data Presentations	3	

BACHELOR OF SCIENCE (BS) PROGRAM – Data Science

Third year Students may elect to take any of the courses below or take additional courses from the courses listed below. Interested students should confer with their mentors before making such decision.

Course No.	Course	Credit(s)	Grade
BDS 249	Introduction to Data Science	3	
BDS 250	Applied Probability & Statistics	3	
BDS 251	Programming in C++ and Java	3	
BDS 252	Data Scripting and Programming - Applications	3	
BDS 253	Computer and Data Architecture	3	
BDS 254	Operating Systems Theory & Design	3	
BDS 255	Computer and Data Science Ethics	3	
BDS 256	Artificial Intelligence & Data Engineering	3	
BDS 257	Systems Analysis & Integration	3	
BDS 258	Data Security Technology	3	
BDS 259	Web Development & Design	3	
BDS 260	Software & Systems Engineering	3	
BDS 261	Software Testing & Automation	3	
BDS 262	Data Structures and Algorithms	3	

BACHELOR OF SCIENCE (BS) PROGRAM – Bioengineering Innovation & Design

Third year Students may elect to take any of the courses below or take additional courses from the courses listed below. Interested students should confer with their mentors before making such decision.

Course No.	Course	Credit(s)	Grade
BID 207	Introduction to Bioengineering Innovation & Design	3	
BID 208	Business of Bioengineering Innovation and Design	3	
BID 209	Identification and Validation of Medical Device Needs	3	
BID 210	Identification and Validation of Global Health Needs	3	
BID 211	Insight Informed Innovation I	3	
BID 212	Seminar: Special Topics in Bioengineering Innovation and Design	3	
BID 213	Regulation of Medical Devices	3	
BID 214	Biomedical Device Design and Innovation (for US and Global markets)	3	
BID 215	Principles and Practice of Global Health Innovation and Design in Bioengineering	3	
BID 216	Biology and Biological Innovation and Design	3	
BID 217	Bioengineering Innovation and Technology	3	
BID 218	Research Methods in Biomedical Innovation & Design	3	
BID 219	Bioengineering Innovation and Design Laboratory	3	

BACHELOR OF SCIENCE (BS) PROGRAM – Biomedical Engineering

Third year Students may elect to take any of the courses below or take additional courses from the courses listed below. Interested students should confer with their mentors before making such decision.

Course No.	Course	Credit(s)	Grade
BBE 249	Introduction to Biomedical Engineering	3	
BBE 250	Applied Probability & Statistics	3	
BBE 251	Biological Models and Simulations	3	
BBE 252	Nonlinear Dynamics of Biological Systems	3	
BBE 253	Computer Architecture in Biomedical Engineering	3	
BBE 254	Operating Systems Theory & Design	3	
BBE 255	Linear Signals and Systems	3	
BBE 256	Artificial Intelligence in Biomedical Engineering	3	
BBE 257	Biomedical Systems Analysis & Integration	3	
BBE 258	Biomedical Security Technology	3	
BBE 259	Biology and Biological Engineering	3	
BBE 260	Biomedical Engineering and Technology	3	
BBE 261	Research Methods in Biomedical Engineering	3	
BBE 262	Biomedical Engineering Laboratory	3	

BACHELOR OF SCIENCE (BS) PROGRAM
Chemical & Biomolecular Engineering

Third year Students may elect to take any of the courses below or take additional courses from the courses listed below. Interested students should confer with their mentors before making such decision.

Course No.	Course	Credit(s)	Grade
CBE 249	Introduction to Chemical & Biomolecular Engineering	3	
CBE 250	Applied Probability & Statistics	3	
CBE 251	Chemical Engineering Today	3	
CBE 252	Chemical & Biological Process Analysis	3	
CBE 253	Engineering Thermodynamics	3	
CBE 254	Chemical Engineering Modeling and Design	3	
CBE 255	Kinetic Processes	3	
CBE 256	Artificial Intelligence in Chemical & Biomolecular Engineering	3	
CBE 257	Cell Biology for Engineers	3	
CBE 258	WMD Prevention in Chemical & Biomolecular Engineering	3	
CBE 259	Product Design in Chemical & Biomolecular Engineering	3	
CBE 260	Renewable Energy Technologies	3	
CBE 261	Statistical Modeling and Analysis with Python	3	
CBE 262	Metabolic Systems Biotechnology	3	
CBE 263	Dynamic Modeling and Control	3	

BACHELOR OF SCIENCE (BS) PROGRAM – Civil & Systems Engineering

Third year Students may elect to take any of the courses below or take additional courses from the courses listed below. Interested students should confer with their mentors before making such decision.

Course No.	Course	Credit(s)	Grade
CSE 207	Introduction to Civil & Systems Engineering	3	
CSE 208	Civilization Engineered	3	
CSE 209	Civilization Engineered: Data-driven Solutions for Communities	3	
CSE 210	Statics, Systems, & Mechanics of Materials	3	
CSE 211	Uncertainty, Reliability and Decision-Making	3	
CSE 212	Structural Systems I and II	3	
CSE 213	Software & Systems Architectural Engineering	3	
CSE 214	Engineering Mechanics and Materials	3	
CSE 215	Leadership in Civil & Systems Engineering	3	
CSE 216	Dynamical Systems	3	
CSE 217	Architectural Engineering - Form, Function and Technology	3	
CSE 218	Bridge & Buildings Structure Engineering	3	
CSE 219	Natural Disaster Risk Modeling	3	

BACHELOR OF SCIENCE (BS) PROGRAM – Mechanical & Systems Engineering

Third year Students may elect to take any of the courses below or take additional courses from the courses listed below. Interested students should confer with their mentors before making such decision.

Course No.	Course	Credit(s)	Grade
MSE 207	Introduction to Mechanical & Systems Engineering	3	
MSE 208	Mechanical Engineering Dynamics	3	
MSE 209	Manufacturing Engineering Theory	3	
MSE 210	Manufacturing Engineering Laboratory	3	
MSE 211	Mechanical Engineering Thermodynamics	3	
MSE 212	Electronics & Instrumentation	3	
MSE 213	Manufacturing Engineering	3	
MSE 214	Design and Analysis of Dynamical Systems	3	
MSE 215	Artificial Intelligence in MSE	3	
MSE 216	Materials Selection	3	
MSE 217	Engineering Design Process	3	
MSE 218	Mechanics of Advanced Engineering Structures	3	
MSE 219	Computer-Aided Design	3	
MSE 220	Aerospace Structures	3	
MSE 221	Robot Sensors/Actuators	3	
MSE 222	Dynamics of Robots and Spacecraft	3	
MSE 223	Mechanics of Flight	3	
MSE 224	Intermediate Fluid Mechanics	3	
MSE 225	Applied Finite Element Analysis	3	
MSE 226	Fundamentals, Design Principles and Applications of Microfluidic Systems	3	
MSE 227	Energy Systems Analysis	3	

BACHELOR OF SCIENCE (BS/MS) PROGRAM- Materials Science & Engineering

Third year Students may elect to take any of the courses below or take additional courses from the courses listed below. Interested students should confer with their mentors before making such decision.

Course No.	Course	Credit(s)	Grade
BSE 249	Introduction to Materials Science & Engineering	3	
BSE 250	Applied Probability & Statistics	3	
BSE 251	MSE Design Team	3	
BSE 252	Structure Of Materials	3	
BSE 253	Thermodynamics/Materials	3	
BSE 254	Electronic Properties of Materials	3	
BSE 255	Mechanical Properties of Materials	3	
BSE 256	Artificial Intelligence in MSE	3	
BSE 257	Systems Analysis & Integration	3	
BSE 258	Physical Chemistry of Materials	3	
BSE 259	Micro and Nano Structured Materials & Devices	3	
BSE 260	Software & Systems Engineering	3	
BSE 261	Advanced Materials for Battery	3	
BSE 262	Biomolecular Materials I - Soluble Proteins & Amphiphiles	3	

BACHELOR OF SCIENCE (BS) PROGRAM- Mechanical & Software Engineering

Third year Students may elect to take any of the courses below or take additional courses from the courses listed below. Interested students should confer with their mentors before making such decision.

Course No.	Course	Credit(s)	Grade
MAE 249	Introduction to Mechanical & Software Engineering	3	
MAE 250	Applied Probability & Statistics	3	
MAE 251	Mechanical Engineering Dynamics	3	
MAE 252	Manufacturing Engineering Theory	3	
MAE 253	Manufacturing Engineering Laboratory	3	
MAE 254	Operating Systems Theory & Design	3	
MAE 255	Software Engineering Requirements	3	
MAE 256	Artificial Intelligence in MSE	3	
MAE 257	Software Analysis & Integration	3	
MAE 258	MSE Risk Management and Prevention	3	
MAE 259	Web Development & Design in MSE	3	
MAE 260	Software & Systems Engineering	3	
MAE 261	Software Testing & Automation in MSE	3	
MAE 262	Mechanics of Advanced Engineering Structures	3	