# ECU COURSE CATALOG

## 2025-2026 COMPUTER SCIENCE COURSES

**CMPSC-1113 Computer Programming I 3 Credits**
INTRODUCTION TO THE THEORY AND TECHNIQUES OF PROGRAMMING USING HIGH-LEVEL LANGUAGES. EQUIVALENT TO COURSE CS1 OF THE ASSOCIATION FOR COMPUTING MACHINERY RECOMMENDED CURRICULUM. Required Previous or Concurrent: MATH-1513, MATH-1613 or departmental approval.

**CMPSC-1133 Computer Programming II 3 Credits**
MODERN PROGRAMMING TECHNIQUES, INCLUDING TOP-DOWN DESIGN, BOTTOM-UP DESIGN, AND STRUCTURED TECHNIQUES ARE STUDIED. THE LANGUAGE OF INSTRUCTION IS A MODERN, STRUCTURED PROGRAMMING LANGUAGE. THIS COURSE IS EQUIVALENT TO COURSE CS2 IN THE ASSOCIATION FOR COMPUTING MACHINERY RECOMMENDED CURRICULUM. Required Previous: CMPSC-1113 or departmental approval.

**CMPSC-1513 Computer Literacy 3 Credits**
A MULTIDISCIPLINARY STUDY OF CONCEPTS, TERMS, AND TRENDS IN COMPUTING, AUGMENTED WITH DATABASE, SPREADSHEET, WORD PROCESSING AND INTERNET SKILLS. THIS COURSE EQUIPS THE STUDENT TO FUNCTION IN THE INFORMATION AGE.

**CMPSC-2881 Subject Named in Title Listing Special Studies in Computer Science - 1 Credit**
DIRECTED GROUP STUDY ON SPECIAL SUBJECT OR PROBLEM.

**CMPSC-2882 Subject Named in Title Listing Special Studies in Computer Science - 2 Credits**
DIRECTED GROUP STUDY ON SPECIAL SUBJECT OR PROBLEM.

**CMPSC-2883 Subject Named in Title Listing Special Studies in Computer Science - 3 Credits**
DIRECTED GROUP STUDY ON SPECIAL SUBJECT OR PROBLEM.

**CMPSC-2884 Subject Named in Title Listing Special Studies in Computer Science - 4 Credits**
DIRECTED GROUP STUDY ON SPECIAL SUBJECT OR PROBLEM.

**CMPSC-3113 Operating Systems 3 Credits**
THE FUNCTIONS OF AN OPERATING SYSTEM INCLUDING THE FILE SYSTEM, THE RESIDENT MONITOR, INTERRUPT PROCESSING, MULTIPROCESSING, AND TIMESHARING SYSTEMS. EQUIVALENT TO COURSE CS6 OF THE ASSOCIATION FOR COMPUTING MACHINERY RECOMMENDED CURRICULUM. Required Previous or Concurrent: CMPSC-3613

**CMPSC-3213 Organization of Programming Languages 3 Credits**
THE SYNTAX, ORGANIZATION, AND RUN-TIME BEHAVIOR OF SEVERAL HIGH-LEVEL PROGRAMMING LANGUAGES IS EXPLORED. BLOCK STRUCTURED LANGUAGES, DATA TYPES, CONTROL STRUCTURES AND DATA FLOW, AND MANAGEMENT OF STORAGE ARE EXAMINED. THIS COURSE IS EQUIVALENT TO COURSE CS8 IN THE ASSOCIATION FOR COMPUTING MACHINERY RECOMMENDED CURRICULUM. Required Previous: CMPSC-1133

**CMPSC-3233 Linux Tools 3 Credits**
USING THE TOOLS AVAILABLE UNDER THE LINUX SYSTEM, INCLUDING SOFTWARE DEVELOPMENT TOOLS. Required Previous: CMPSC-1113

**CMPSC-3243 Fundamentals of Cloud Computing 3 Credits**
THIS COURSE INTRODUCES LEARNERS TO THE FOUNDATIONAL CONCEPTS OF CLOUD COMPUTING, SURVEYING THE MAJOR CLOUD SERVICE PROVIDERS, KEY OFFERINGS, AND DEPLOYMENT MODELS. LEARNERS EXPLORE THE BASIC ARCHITECTURE OF CLOUD SERVICES, EXAMINING PUBLIC, PRIVATE, AND HYBRID CLOUD ENVIRONMENTS, AS WELL AS THE DIFFERENCES BETWEEN INFRASTRUCTURE AS A SERVICE (IAAS), PLATFORM AS A SERVICE (PAAS), AND SOFTWARE AS A SERVICE (SAAS) DELIVERY MODELS. LEARNERS GAIN PRACTICAL EXPERIENCE USING CLOUD PROVIDER TOOLS, CONFI Required Previous: CMPSC-1133

**CMPSC-3253 Introduction to Cloud Security 3 Credits**
THIS COURSE FOCUSES ON THE ESSENTIAL INFORMATION SECURITY PRINCIPLES AND STRATEGIES FOR SECURING CLOUD INFRASTRUCTURES. LEARNERS EXPLORE THE PRIMARY DIFFERENCES BETWEEN TRADITIONAL ON-PREMISES COMPUTING ENVIRONMENTS AND TYPICAL CLOUD DEPLOYMENTS MODELS, WITH AN EMPHASIS ON RISK MANAGEMENT, COMPLIANCE, AND THE DYNAMIC CHALLENGES OF CLOUD SECURITY. TOPICS INCLUDE ASSET MANAGEMENT, DATA PROTECTION, IDENTITY AND ACCESS MANAGEMENT, AND NETWORK ACCESS. LEARNERS GAIN AN UNDERSTANDING OF HOW TO DESIGN A Required Previous: CMPSC-3243

**CMPSC-3323 Internet Programming 3 Credits**
TECHNICAL ISSUES CONCERNING THE INTERNET AND PROGRAMMING ON THE INTERNET, INCLUDING HYPERTEXT DOCUMENT CREATION AND DELIVERY, CLIENT-SERVER SYSTEMS, GRAPHICS, SERVER INTERFACE PROGRAMS, AND APPROPRIATE LANGUAGES. Required Previous: CMPSC-1133

**CMPSC-3543 Object Oriented Programming 3 Credits**
OBJECT ORIENTED SOFTWARE DEVELOPMENT IS STUDIED USING C++ OR OTHER MODERN OBJECT ORIENTED LANGUAGE. TOPICS COVERED INCLUDE CLASSES, INHERITANCE AND POLYMORPHISM. Required Previous or Concurrent: CPSMA-2103

**CMPSC-3613 Computer Architecture 3 Credits**
ARCHITECTURE INCLUDING NUMBER SYSTEMS, CPA, ARITHMETIC, PRIMARY AND SECONDARY MEMORY. INSTRUCTION SETS AND ASSEMBLER LEVEL PROGRAMMING. EQUIVALENT TO COURSE CS3 IN THE ASSOCIATION FOR COMPUTING MACHINERY RECOMMENDED CURRICULUM. Required Previous: CMPSC-1133

**CMPSC-3943 Software Design & Development 3 Credits**
THE SOFTWARE DEVELOPMENT LIFE CYCLE AND CONCEPTS OF LARGE-SCALE SOFTWARE DEVELOPMENT ARE EXPLORED. SIGNIGICANT SOFTWARE PROJECT WORK WILL ALSO BE ACCOMPLISHED. THE TEAM PROGRAMMING CONCEPT IS UTILIZED. THIS COURSE IS EQUIVALENT TO COURSE CS14 IN THE ASSOCIATION FOR COMPUTING MACHINERY RECOMMENDED CURRICULUM. Required Previous: CPSMA-2103

**CMPSC-4213 Data Base Design 3 Credits**
SEVERAL DATA MODELS ARE EXAMINED, WITH EMPHASIS ON RELATIONAL MODELS. DATA BASE DESIGN IS STUDIED, AND APPLICATIONS ARE IMPLEMENTED. EQUIVALENT TO COURSE CS11 OF THE ASSOCIATION FOR COMPUTING MACHINERY RECOMMENDED CURRICULUM. Required Previous: CPSMA-2103

**CMPSC-4223 UNIX System Administration 3 Credits**
ADMINISTRATION OF UNIX TIMESHARING SYSTEMS, INCLUDING SPOOLING, INSTALLATION, MAINTENANCE, AND INTERCOMPUTER COMMUNICATIONS. Required Previous: CPSMA-2103

**CMPSC-4273 Modeling and Simulation Using Parallel Computing 3 Credits**
METHODS, SCIENCE, ALGORITHMS AND PRACTICE OF MODELING AND SIMULATION PROCESSING USING SMALL TO LARGE SCALE PARALLEL COMPUTING. TOPICS INCLUDE: ELECTROMAGNETICS, CLIMATE/WEATHER, AIRCRAFT MODELING, DNA-RELATED BIOINFORMATICS, MEDICAL IMAGING, GAMING, ARTIFICIAL INTELLIGENCE (AI) AND NATURAL LANGUAGE PROCESSING AREAS. Required Previous: CMPSC-1113

**CMPSC-4473 Theory of Programming Languages 3 Credits**
THE DESIGN AND CONSTRUCTION OF COMPILERS. THE THEORY OF PARSING, LANGUAGE THEORY, AND GENERAL PARSING METHODS ARE COVERED. CONTEXT FREE AND CONTEXT DEPENDENT LANGUAGES AND DETERMINISTIC PARSING METHODS ARE STUDIED. THIS COURSE IS EQUIVALENT TO COURSE CS15 IN THE ASSOCIATION FOR COMPUTING MACHINERY RECOMMENDED CURRICULUM. Required Previous: CMPSC-3943

**CMPSC-4881 Practicum in Computer Science 1 Credit**
SUPERVISED PRACTICAL EXPERIENCE IN A COMPUTER CENTER WORKING WITH AN APPLICATION WHICH IS IN PRODUCTION OR ONE WHICH WILL BE PUT INTO PRODUCTION. Required Previous: Take twelve (12) twelve hours of Computer Science and Departmental Approval.

**CMPSC-4882 Practicum in Computer Science 2 Credits**
SUPERVISED PRACTICAL EXPERIENCE IN A COMPUTER CENTER WORKING WITH AN APPLICATION WHICH IS IN PRODUCTION OR ONE WHICH WILL BE PUT INTO PRODUCTION. Required Previous: Take twelve (12) twelve hours of Computer Science and Departmental Approval.

**CMPSC-4883 Practicum in Computer Science 3 Credits**
SUPERVISED PRACTICAL EXPERIENCE IN A COMPUTER CENTER WORKING WITH AN APPLICATION WHICH IS IN PRODUCTION OR ONE WHICH WILL BE PUT INTO PRODUCTION. Required Previous: Take twelve (12) twelve hours of Computer Science and Departmental Approval.

**CMPSC-4884 Practicum in Computer Science 4 Credits**
SUPERVISED PRACTICAL EXPERIENCE IN A COMPUTER CENTER WORKING WITH AN APPLICATION WHICH IS IN PRODUCTION OR ONE WHICH WILL BE PUT INTO PRODUCTION. Required Previous: Take twelve (12) twelve hours of Computer Science and Departmental Approval.

**CMPSC-4981 Seminar- 1 Credit**
DIRECTED GROUP STUDY ON SPECIAL SUBJECT OR PROBLEM.

**CMPSC-4982 Seminar- 2 Credits**
DIRECTED GROUP STUDY ON SPECIAL SUBJECT OR PROBLEM.

**CMPSC-4983 Seminar- 3 Credits**
DIRECTED GROUP STUDY ON SPECIAL SUBJECT OR PROBLEM.

**CMPSC-4984 Seminar- 4 Credits**
DIRECTED GROUP STUDY ON SPECIAL SUBJECT OR PROBLEM.

**CMPSC-4991 Individual Studies- 1 Credit**
DIRECTED INDIVIDUAL STUDY ON SPECIAL SUBJECT OR PROBLEM.

**CMPSC-4992 Individual Studies- 2 Credits**
DIRECTED INDIVIDUAL STUDY ON SPECIAL SUBJECT OR PROBLEM.

**CMPSC-4993 Individual Studies- 3 Credits**
DIRECTED INDIVIDUAL STUDY ON SPECIAL SUBJECT OR PROBLEM.

**CMPSC-4994 Individual Studies- 4 Credits**
DIRECTED INDIVIDUAL STUDY ON SPECIAL SUBJECT OR PROBLEM.

**CMPSC-5981 Seminar- 1 Credit**
DIRECTED INTENSIVE STUDY ON SELECTED PROBLEM OR SPECIAL TOPIC.

**CMPSC-5982 Seminar- 2 Credits**
DIRECTED INTENSIVE STUDY ON SELECTED PROBLEM OR SPECIAL TOPIC.

**CMPSC-5983 Seminar- 3 Credits**
DIRECTED INTENSIVE STUDY ON SELECTED PROBLEM OR SPECIAL TOPIC.

**CMPSC-5984 Seminar- 4 Credits**
DIRECTED INTENSIVE STUDY ON SELECTED PROBLEM OR SPECIAL TOPIC.

**CMPSC-5991 Individual Studies- 1 Credit**
DIRECTED INTENSIVE STUDY ON DEFINITE PROBLEM OR SPECIAL SUBJECT, BASED ON APPROVED OUTLINE OR PLAN, CONFERENCES, ORAL AND WRITTEN REPORTS.

**CMPSC-5992 Individual Studies- 2 Credits**
DIRECTED INTENSIVE STUDY ON DEFINITE PROBLEM OR SPECIAL SUBJECT, BASED ON APPROVED OUTLINE OR PLAN, CONFERENCES, ORAL AND WRITTEN REPORTS.

**CMPSC-5993 Individual Studies- 3 Credits**
DIRECTED INTENSIVE STUDY ON DEFINITE PROBLEM OR SPECIAL SUBJECT, BASED ON APPROVED OUTLINE OR PLAN, CONFERENCES, ORAL AND WRITTEN REPORTS.

**CMPSC-5994 Individual Studies- 4 Credits**
DIRECTED INTENSIVE STUDY ON DEFINITE PROBLEM OR SPECIAL SUBJECT, BASED ON APPROVED OUTLINE OR PLAN, CONFERENCES, ORAL AND WRITTEN REPORTS.

**CMPSC-A2213 Computer Languages-PHP 3 Credits**
PROGRAMMING APPLICATIONS AND TECHNIQUES USING THE SPECIFIED LANGUAGE. EQUIVALENT TO COURSE CS5 OF THE ASSOCIATION FOR COMPUTING MACHINERY RECOMMENDED CURRICULUM.

**CMPSC-A3313 Advanced Computer Language- Php 3 Credits**
ADVANCED STUDY OF A PROGRAMMING LANGUAGE WHICH MAY INCLUDE TOPICS SUCH AS OBJECT-ORIENTED PROGRAMMING, CLIENT-SERVER COMMUNICATIONS, DATABASE INTERFACE, CRYPTOGRAPHY, WEB PROGRAMMING, AND OTHER LANGUAGES SPECIFIC FEATURES. THIS COURSE MAY BE REPEATED WITH DIFFERENT LANGUAGE FOR CREDIT. Required Previous: Take CMPSC-1133 and CPSMA-2103

**CMPSC-B2213 Computer Languages-BASIC 3 Credits**
PROGRAMMING APPLICATIONS AND TECHNIQUES USING THE SPECIFIED LANGUAGE. EQUIVALENT TO COURSE CS5 OF THE ASSOCIATION FOR COMPUTING MACHINERY RECOMMENDED CURRICULUM.

**CMPSC-C2213 Computer Languages-Cobol 3 Credits**
PROGRAMMING APPLICATIONS AND TECHNIQUES USING THE SPECIFIED LANGUAGE. EQUIVALENT TO COURSE CS5 OF THE ASSOCIATION FOR COMPUTING MACHINERY RECOMMENDED CURRICULUM.

**CMPSC-F2213 Computer Languages-FORTRAN 3 Credits**
PROGRAMMING APPLICATIONS AND TECHNIQUES USING THE SPECIFIED LANGUAGE. EQUIVALENT TO COURSE CS5 OF THE ASSOCIATION FOR COMPUTING MACHINERY RECOMMENDED CURRICULUM.

**CMPSC-H1113 Honors-Computer Programming I 3 Credits**
INTRODUCTION TO THE THEORY AND TECHNIQUES OF PROGRAMMING USING HIGH-LEVEL LANGUAGES. EQUIVALENT TO COURSE CS1 OF THE ASSOCIATION FOR COMPUTINGMACHINERY RECOMMENDED CURRICULUM. Required Previous or Concurrent: MATH-1513 or departmental approval.

**CMPSC-H1513 Honors-Computer Literacy 3 Credits**
A MULTIDISCIPLINARY STUDY OF CONCEPTS, TERMS, AND TRENDS IN COMPUTING, AUGMENTED WITH DATABASE, SPREADSHEET, WORD PROCESSING AND INTERNET SKILLS. THIS COURSE EQUIPS THE STUDENT TO FUNCTION IN THE INFORMATION AGE.

**CMPSC-H3213 Honors-Orgztn Prgmng Lang 3 Credits**
THE SYNTAX, ORGANIZATION, AND RUN-TIME BEHAVIOR OF SEVERAL HIGH-LEVEL PROGRMMING LANGUAGES IS EXPLORED. BLOCK STRUCTURED LANGUAGES, DATA TYPES,CONTROL STRUCTURES AND DATA FLOW, AND MANAGEMENT OF STORAGE ARE EXAMINED. THIS COURSE IS EQUIVALENT TO COURSE CS8 IN THE ASSOCIATION FOR COMPUTING MACHINERY RECOMMENDED CURRICULUM.

**CMPSC-H3543 Honors-Objct Orien Progrmg 3 Credits**
OBJECT ORIENTED SOFTWARE DEVELOPMENT IS STUDIED USING C++ OR OTHER MODERN OBJECT ORIENTED LANGUAGE. TOPICS COVERED INCLUDE CLASSES, INHERITANCEAND POLYMORPHISM. Required Previous or Concurrent: Take CPSMA-2103

**CMPSC-H3613 Honors-Computer Architecture 3 Credits**
ARCHITECTURE INCLUDING NUMBER SYSTEMS, CPU, ARITHMETIC, PRIMARY AND SECONDARY MEMORY. INSTRUCTION SETS AND ASSEMBLER LEVEL PROGRAMMING. EQUIVALENT TO COURSE CS3 IN THE ASSOCIATION FOR COMPUTING MACHINERY RECOMMENDED CURRICULUM.

**CMPSC-H4213 Honors-Database Design 3 Credits**
SEVERAL DATA MODELS ARE EXAMINED, WITH EMPHASIS ON RELATIONAL MODELS. DATA BASE DESIGN IS STUDIED, AND APPLICATIONS ARE IMPLEMENTED. EQUIVALENTTO COURSE CS11 OF THE ASSOCIATION FOR COMPUTING MACHINERY RECOMMENDED CU RRICULUM. Required Previous: Take CPSMA-2103

**CMPSC-H4273 Honors-Modeling and Simulation Using Parallel Computing 3 Credits**
METHODS, SCIENCE, ALGORITHMS AND PRACTICE OF MODELING AND SIMULATION PROCESSING USING SMALL TO LARGE SCALE PARALLEL COMPUTING. TOPICS INCLUDE: ELECTROMAGNETICS, CLIMATE/WEATHER, AIRCRAFT MODELING, DNA-RELATED BIOINFORMATICS, MEDICAL IMAGING, GAMING, ARTIFICIAL INTELLIGENCE (AI) AND NATURAL LANGUAGE PROCESSING AREAS. Required Previous: CMPSC-1113

**CMPSC-H4473 Honors-Theory Progrmng Languages 3 Credits**
THE DESIGN AND CONSTRUCTION OF COMPILERS. THE THEORY OF PARSING, LANGUAGE THEORY, AND GENERAL PARSING METHODS ARE COVERED. CONTEXT FREE AND CONTEXT DEPENDENT LANGUAGES AND DETERMINISTIC PARSING METHODS ARE STUDIED. THIS COURSE IS EQUIVALENT TO COURSE CS15 IN THE ASSOCIATION FOR COMPUTING MACHINERY RECOMMENDED CURRICULUM.

**CMPSC-H4983 Honors-Seminar- 3 Credits**
DIRECTED GROUP STUDY ON SPECIAL SUBJECT OR PROBLEM.

**CMPSC-H4993 Honors-Individual Studies- 3 Credits**
DIRECTED INDIVIDUAL STUDY ON SPECIAL SUBJECT OR PROBLEM.

**CMPSC-J2213 Computer Languages-Java 3 Credits**
PROGRAMMING APPLICATIONS AND TECHNIQUES USING THE SPECIFIED LANGUAGE. EQUIVALENT TO COURSE CS5 OF THE ASSOCIATION FOR COMPUTING MACHINERY RECOMMENDED CURRICULUM.

**CMPSC-J3313 Adv Computer Lang-Java 3 Credits**
ADVANCED STUDY OF A PROGRAMMING LANGUAGE WHICH MAY INCLUDE TOPICS SUCH AS OBJECT-ORIENTED PROGRAMMING, CLIENT-SERVER COMMUNICATIONS, DATABASE INTERFACE, CRYPTOGRAPHY, WEB PROGRAMMING, AND OTHER LANGUAGES SPECIFIC FEATURES. THIS COURSE MAY BE REPEATED WITH DIFFERENT LANGUAGE FOR CREDIT. Required Previous: Take CMPSC-1133 and CPSMA-2103

**CMPSC-P3313 Advanced Computer Language-Python and PERL 3 Credits**
ADVANCED STUDY OF A PROGRAMMING LANGUAGE WHICH MAY INCLUDE TOPICS SUCH AS OBJECT-ORIENTED PROGRAMMING, CLIENT-SERVER COMMUNICATIONS, DATABASE INTERFACE, CRYPTOGRAPHY, WEB PROGRAMMING, AND OTHER LANGUAGES SPECIFIC FEATURES. THIS COURSE MAY BE REPEATED WITH DIFFERENT LANGUAGE FOR CREDIT. Required Previous: Take CMPSC-1133 and CPSMA-2103

**CMPSC-S5982 Seminar- 2 Credits**
DIRECTED INTENSIVE STUDY ON SELECTED PROBLEM OR SPECIAL TOPIC.

**CMPSC-Y2213 Computer Languages-Python 3 Credits**
PROGRAMMING APPLICATIONS AND TECHNIQUES USING THE SPECIFIED LANGUAGE. EQUIVALENT TO COURSE CS5 OF THE ASSOCIATION FOR COMPUTING MACHINERY RECOMMENDED CURRICULUM.