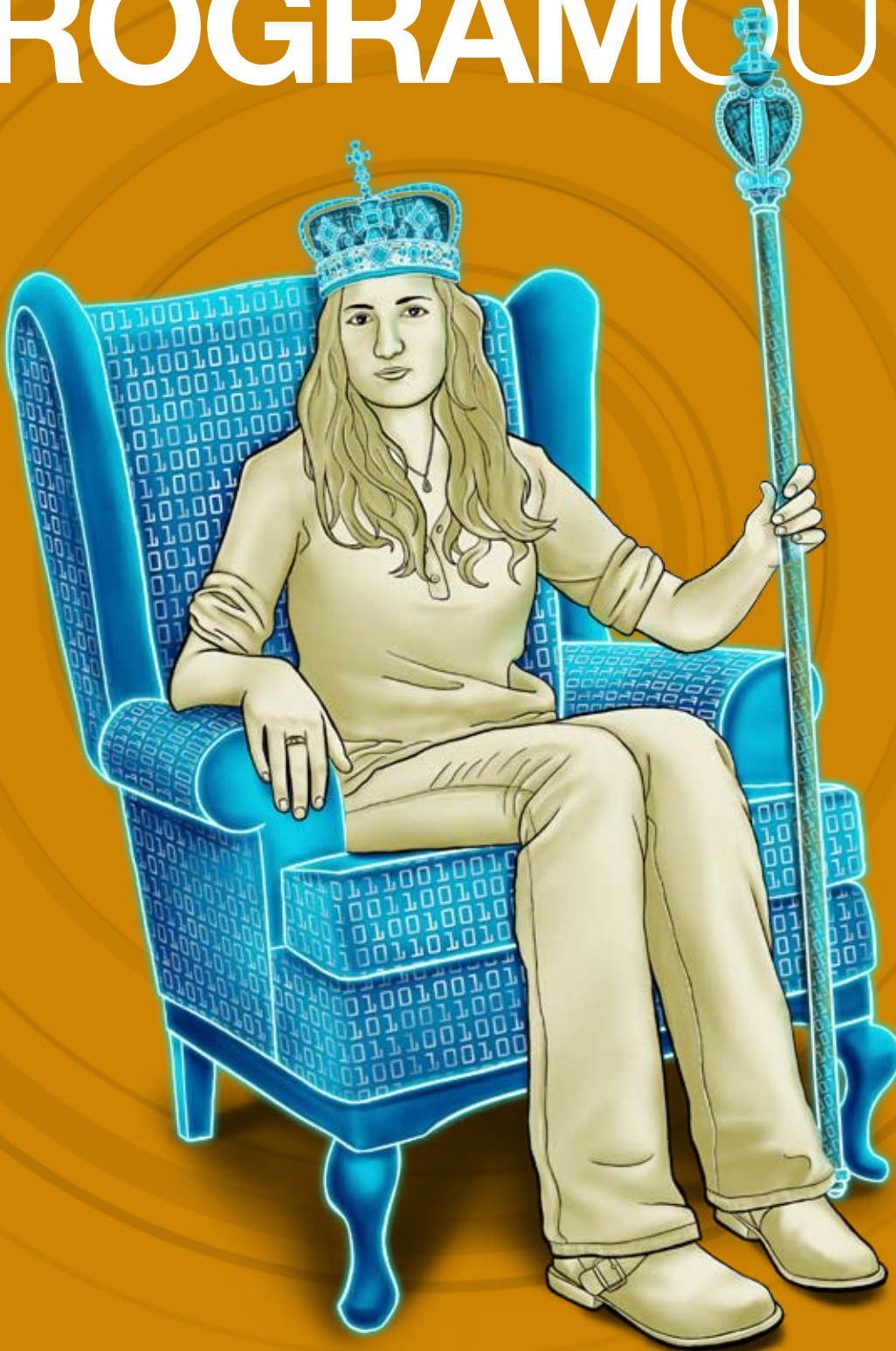


Information Technology with a concentration in **Computer Information Technology**

# PROGRAM OUTLINE



MT SIERRA  
COLLEGE

# Core Class Descriptions

## Bachelors Degree Program Outline

### Information Technology with a concentration in Computer Information Technology

#### CIT-101 | Introduction to PC Hardware and Lab

Prerequisite(s): None

Students receive in-depth exposure to computer hardware while learning to build and maintain computers. This course will enable students to understand the functionality of hardware and software components as well as suggested best practices for maintenance and safety issues. An introduction to networking is also covered. Students will assemble and configure a computer, install operating systems and software, and troubleshoot hardware and software problems in the hands-on lab.

#### CIT-150 | Programming Concepts and Lab

Prerequisite(s): None

Basics of programming concepts including how to solve a problem and process information in a computer are addressed in this course. The course emphasizes how to create a precise list of instructions called a program. Problems will be discussed, solutions developed, and a program in a popular and simple language will be used to obtain results. Boolean logic and set theory will also be discussed in depth. Lab exercises include hands-on experience writing, debugging and running computer programs, as well as guidance in developing procedures using decision-making statements.

#### CIT-102 | Introduction to PC Operating Software and Lab

Prerequisite(s): None

Students study multiuse/multitasking operating systems to understand how operating systems work with computer hardware. The course covers managing and troubleshooting today's popular operating systems, as well as managing computer memory and support hard drives and printers. The hands-on lab will help students learn how to select an operating system and install it on a hard drive. Also covered is the use of utilities to troubleshoot computers and upgrade operating systems.

#### CIT-180 | C Programming and Lab

Prerequisite(s): CIT-150

This course provides the introduction to C programming, including top down planning, structured programming and modular design using conditional branching, looping, switch statements, operations of arrays and functions. Topics covered include number system, structure of C programs, syntax, comments, header files, variable types, programmed decision blocks, logical operators, formatted I/O, library functions, pointer arithmetic, data files, and dynamic memory allocations. Students gain hands-on experience using seven steps: defining the program objective, designing the program, writing the code, compiling, running the program; testing/debugging the program, and maintaining/modifying the program.

#### CIT-120 | Local Area Networks (LANs) I and Lab

Prerequisite(s): None

Introduction to the building blocks, components, technology, standards, and characteristics of local area computer networking is the primary focus of this course. Following the introduction of the basic concepts of networks and network system administration, students build a foundation in current networking technologies for LANs Token Ring, Ethernet, Fiber Distributed Data Interface (FDDI), bridging and switching. The course provides the knowledge necessary to perform post-installation and day-to-day administration in a single-domain and multiple-domain Windows NT based network. In the hands-on lab students will identify the features of Windows 2000 and XP interface, create and customize user and group accounts, administer rights and polices, and configure the user environment.

#### CIT-353 | Understanding UNIX and Lab

Prerequisite(s): CIT-102

This course is designed for non-programming majors. The student is introduced to the multi-user, multi-tasking operating system UNIX/LINUX through the examination of its features and analyzing applications. Application of UNIX operating commands occurs in a hands-on environment. Students will be able to apply theory to a practical application of UNIX operating system features.

#### CIT-210 | Introduction to Database Management and Lab

Prerequisite(s): CIT-101

Concepts and objectives of a successful database management system (DBMS) are covered in this course. The objectives are to learn the purpose of database technology, understand the components of DBMS, develop skills to model user requirements using entity-relationships (top-down) or semantic-objects (bottom-up), explain data normalization, and understand the role of data and database administration. Also presented are concepts of B-Tree indices, database integrity, and SQL language. Case studies are used to emphasize the DBMS concepts, through the use of case studies. Students are provided actual REAL-WORLD PROBLEMS, in a laboratory setting, on implementing key concepts of database management. Students have opportunities to develop and implement various aspects of database administration using systems used in modern business applications.

#### CIT-220 | Local Area Networks (LANs) II and Lab

Prerequisite(s): CIT-101; CIT-102

An introduction to wireless protocols is provided for the design and management of local area networks as well as wide area networks. Students also cover topics ranging from general wireless networking to specific protocols, services and applications. Students receive applied practice in designing wireless local area networks and wide area networks utilizing appropriate protocol services, applications and utilities.

#### CIT-230 | Network Systems Administration I and Lab

Prerequisite(s): CIT-102

This course covers the advanced administrative skills such as how to identify and upgrade software and hardware, simple and custom Network Operating System installation, configuration of Windows 200x, XP, and Vista, and optimization of system performance. Lab experience includes implementing directory services, selecting the most suitable directory services structure for a given business situation, identifying the issues involved in planning an effective directory services structure, analyzing and optimizing servers, creating a measurement baseline by collecting data log files and viewing reports.

#### CIT-235 | Network Systems Administration II and Lab

Prerequisite(s): CIT-230

Setup, configuration, use, and support of TCP/IP and other network services on operating systems such as Microsoft Windows 200X servers covered in the lecture portion of this course. Students will install and configure Windows 2000 Server, identify the network and host ID, identify the function of a subnet mask, identify the difference between static and dynamic IP routing, and configure computers running Windows server.

#### CIT-250 | Object Oriented Systems Analysis, Design and Lab

Prerequisite(s): CIT-150

This course provides the study of design patterns commonly found in a broad range of software domains and exploration of new design techniques for applying object-oriented technology in a learn-by-example format. Lab exercises are designed to help students understand how to develop object-oriented software that is reusable, portable, and extensible.

#### SEC-130 | Introduction to Information Security and Lab

Prerequisite(s): CIT-101; CIT-102

This course introduces the fundamental concepts of information security using the security development life cycle (SDLC) as the framework. Security design, development, and policy implementation strategies for different network environments will also be covered.

#### CIT-275 | Visual Basic and Lab

Prerequisite(s): CIT-250

This course covers how to create sophisticated Visual Basic applications capable of solving business problems. In addition, the events-driven programming model is described. Students will create an application with forms and add functionality for multiple events, as well as functions and sub-routine procedures.

#### CIT-330 | Wide Area Networks (WANs), Internetworking I and Lab

Prerequisite(s): CIT-102

The course provides instruction in the fundamentals of interconnecting computer networks and transporting data, voice, and video applications outside a local area via common carrier lines. Interconnectivity equipment including bridges, routers, gateways and switches as well as Internetworking devices, the OSI reference model, data-link protocols, and network protocols are considered. Students learn to optimize server-to-server network traffic, identify generated scenarios in a CISCO environment, and identify the functions of routers in networking components and Distributed Networking Components.

#### CIT-340 | Internet I and Lab

Prerequisite(s): CIT-101

This course provides instruction on Internet features, services, and capabilities of the Internet. Browsers, search engines, Internet Service Providers, specialty sites, and the World Wide Web will be studied to facilitate designing and publishing WEB home pages. How to author, design, and publish WEB pages will be explored, as well as evolution of the Hyper Text Mark-up Language (HTML), dHTML, CSS, and Javascript. Students will create and design their own WEB site and home pages using text editors, HTML Editors, HTML, word processor add-ons, and conversion tools. Students will explore, in an experiential way, business and personal applications of effective website and Internet applications.

#### CIT-325 | C++ Programming and Lab

Prerequisite(s): CIT-180; CIT-250

Introduction to the basics of using C++ for object-oriented programming (OOP), Input/output (I/O) streams; I/O manipulators; file I/O; function and operator overloading; classes, objects, constructors, destructors and friend functions; inheritance, polymorphism, and composition; virtual base classes, virtual functions and templates are studied. Labs focus on how to create OOPS programs using association of data structures with operation.

# Core Class Descriptions

## Bachelors Degree Program Outline

### Information Technology with a concentration in Computer Information Technology

#### **CIT-335 | Wide Area Networks (WANs), Internetworking II and Lab**

Prerequisite(s): CIT-220; CIT-330

This course provides an in-depth look at network support professionals who install, configure, customize, and support CISCO operating systems. Also discussed are routing concepts and networking utilities provided by various vendors. In the laboratory portion of the course, students are offered hands-on opportunities to install, configure and support a variety of routers. Students learn to troubleshoot and handle common problems in LAN, WAN, and wireless applications.

#### **CIT-390 | UNIX Systems Administration and Lab**

Prerequisite(s): CIT-353

This course addresses UNIX/LINUX administration, command line tools, and troubleshooting system-level problems. Students will gain practical experience as a UNIX Administrator by actually administering UNIX/LINUX and developing problem solving strategies in a real world environment.

#### **CIT-315 | Database Administration and Lab**

Prerequisite(s): CIT-210

This course covers the database administration topics, including installing and configuring the database, managing database components such as tables, queries, reports, managing database access/security, assigning user permissions, how to backup and restore databases, backup and restore considerations, importing and exporting data. Oracle or MS SQL is the platform used to explain the above objectives. Designed databases are used to explain some of the important concepts studied in this course. The labs are designed to create databases, tables, queries, and reports. Students have hands-on opportunities to administer databases that are in common use in the modern business environment.

#### **CIT-360 | Systems Analysis, Design Methodology and Lab**

Prerequisite(s): CIT-250

This course covers tools and techniques used in systems analysis, design, and project management. Topics include preparation of system specifics, detailed system design, Gantt charts, Performance Evaluation and Review Technique (PERT), and data flow diagrams. Practical discussions of alternative forms of input, output, processing, storage and telecommunications, as well as methodology for analyzing business needs, designing appropriate solutions, and managing their implementations are also covered. Design model standards such as Windows Open Services Architecture (WOSA) and Common Object Request Broker Architecture (CORBA) are previewed. Case studies are used to evaluate the different methods of analyzing the flow of data, using the information presented in the laboratory portion of the course. Students are given practical experience in analyzing the effectiveness of various systems using a variety of computerized applications.

#### **CIT-420 | Network Management I and Lab**

Prerequisite(s): CIT-235

This course provides the skills to plan and implement network operating systems. Topics cover proper use of networking protocols, as well as networking services such as DHCP, DNS, WINS, RA, IP Routing and IP Security. Using Windows 200x, students will design, implement, and support the server in a multi-domain enterprise environment. Students will create a measurement baseline by collecting data, creating log files, and viewing the reports of the log files. Students participate in hands-on use of OSI-based network management software and other network management platforms.

#### **PMT-310 | Project Management and Lab**

Prerequisite(s): BUS-100

This course covers implementation and management of projects. Resource management, conflict management, negotiation, and advanced scheduling techniques are also covered. Also covered is the application of popular project management software applications. Typical project plans are developed and analyzed based on real-world projects.

#### **CIT-345 | Internet II and Lab**

Prerequisite(s): CIT-340

This course expands on the services and capabilities of the Internet by focusing on Internet Commerce. Topics such as design, revenue, and security will be covered. Students will design eCommerce websites using the tools covered in CIT 340, Internet I, as well as plug modules designed to handle payment, shipping and security.

#### **CIT-370 | Programming C/C++ in UNIX and Lab**

Prerequisite(s): CIT-325; CIT-353

Application of UNIX and Linux popular scripting languages is the focus of this course. Students will develop an understanding of the shell, including various commands and syntax and all available major text filtering tools. Students gain practical experience in basic and advanced shell programming techniques. Students will use scripting languages in the development of actual programs.

#### **CIT-405 | Structured Query Language (SQL) and Lab**

Prerequisite(s): CIT-275; CIT-315

The course covers this high-performance database management system designed to meet the demanding requirements of distributed client/server computing, supporting very large databases through its integration with Open Database Connect technology. Students learn to write and execute SQL code using Microsoft or Oracle tools. Students put into practice database design, indices, joins, sub queries, views, data integrity, creating and filtering a database, selecting data, sorting, grouping and joining tables.

#### **CIT-425 | Network Management II and Lab**

Prerequisite(s): CIT-420

This course covers the integration of network management approaches to multi protocol internetworks. Simple Network Management Protocol (SNMP) is also covered in depth. Emphasis is placed on one of the following: HP Open View, IBM's View Point, or other popular network management tools. Experience in configuring and operating interconnectivity hardware and popular network management software is included.

#### **CIT-465 | Programming with JAVA and Lab**

Prerequisite(s): CIT-360

Techniques to develop applications for the desktop environment and Internet will be addressed in this course. Students in this course will write their own program using either the Microsoft environment, or the Abstract Windowing Toolkit (AWT) in combination with JAVA applications called applets. Hands on experience are given in the creation of JAVA programs and data modeling using JAVA syntax.

#### **CIT-455 | Database Design, Implementation and Lab**

Prerequisite(s): CIT-315; CIT-405

This course presents an Oracle or Microsoft relational database management system for client/server application development. The fundamentals of design concepts including concerns and problems are presented. Students perform a number of exercises designed to teach the basic tools of Oracle or Microsoft, including table and index creation, screen and report generation, SQL load utilities, and an overview of embedded SQL. Query optimization and database recovery are also covered.

#### **PMT-410 | Applied Project Management: Senior Project I and Lab**

Prerequisite(s): PMT-310

Note: Open to students in their tenth term or higher. Students must complete PMT 410 and PMT 499 in consecutive terms.

Includes managing multiple projects and sharing resources on large, complex projects and prepares students to work on their Senior Project. The course focuses on the advanced skills in using project management software. Scheduling and managing multiple projects, managing sub projects, and sharing resources between multiple projects are also explored. Students will begin work on their senior projects. Projects will be completed in PMT-499.

#### **CIT-445 | IntraNetworking II and Lab**

Prerequisite(s): CIT-420

This course continues concepts learned in CIT-420, Network Management I, by focusing on applied network management functions. This course includes configuring, administering, and troubleshooting services available within a network infrastructure such as DNS, DHCP, RIP, RAS, as well as active directory objects such as users and groups. Students are provided a hands-on opportunity to configure routers, build an internetwork with multiple networks and routing protocols utilizing a variety of media.

#### **CIT-490 | Computer Aided Software Engineering (CASE) Tools and Lab**

Prerequisite(s): CIT 465

Tools used to automate software construction and aid in the analysis and design of large software systems—computer-based software engineering tools are discussed and applied. Topics include team-work, software standards and processes, personal software processes, software engineering (CASE) tools (i.e., CASE tools for classical and object-oriented software specification, analysis, design, verification, validation, testing, and maintenance. Students write complete code using event-flow, state-transition, data-flow, and other such analysis and design diagrams in a laboratory setting.

#### **PMT 499 | Senior Project II**

Prerequisite(s): PMT-410

Students must complete PMT 410 and PMT 499 in consecutive terms. Students complete their senior project, begun in PMT 410, with the application of acquired skills and knowledge. Working as members of a project team, students solve a real world industry problem. Evaluation of student performance is shared between faculty members and industry representatives. The course enhances students' skills using software to analyze, develop, measure and report on Senior Project activities and results. Students will have the opportunity to work with business and non-profit community organizations in the application of strategies to increase effectiveness of the organization through the use of computerized tools.

# Projected Quarterly Schedule

## Bachelors Degree Program Outline

### Information Technology with a concentration in **Computer Information Technology**

**Q01** CIT 101 Introduction to PC Hardware & Lab  
CIT 150 Programming Concepts & Lab  
ENG 080 Evolving English (if required)  
PDT 115 College Research & Study Skills  
SOC 165 Sociology

**Q02** CIT 102 Introduction to PC Operating Software & Lab  
CIT 180 C Programming & Lab  
ENG 135 English Composition  
MTH 080 Technical Mathematics (if required)  
PSY 215 Psychology

**Q03** CIT 120 Local Area Networks I (LANs I) & Lab  
CIT 353 Understanding UNIX & Lab  
ENG 155 Advanced English Composition  
MTH 135 College Algebra

**Q04** CIT 210 Introduction to Database Management & Lab  
CIT 220 Local Area Networks II & Lab  
CIT 230 Network Systems Administration I & Lab  
GE 1 General Education Elective

**Q05** BUS 100 Business Fundamentals  
CIT 235 Network Systems Administration II & Lab  
CIT 250 Object Oriented Sys Analysis & Design & Lab  
SEC 130 Introduction to Information Security & Lab  
PHL 145 Critical Thinking & Problem Solving

**Q06** CIT 275 Visual Basic & Lab  
CIT 330 WANS & Internet I & Lab  
CIT 340 Internet I & Lab  
ENG 300 Professional Writing

**Q07** CIT 325 C++ Programming & Lab  
CIT 335 WANS & Internet II & Lab  
CIT 390 UNIX System Administration & Lab  
SPH 305 Speech Communication

**Q08** CIT 315 Database Administration & Lab  
CIT 360 Systems Analysis & Design & Lab  
CIT 420 Network Management I & Lab  
PMT 310 Project Management & Lab

**Q09** CIT 345 Internet II & Lab  
CIT 370 Programming C/C++ in UNIX & Lab  
CIT 405 Structured Query Language & Lab  
CIT 425 Network Management II & Lab

**Q10** CIT 465 JAVA & Lab  
GE 2 General Education Elective  
PDT 425 Career Strategies  
PHL 405 Ethics & Legal Issuesc

**Q11** BUS 150 Business Law  
CIT 455 Database Design & Implementation & Lab  
ENG 335 Introduction to Literature  
PMT 410 Senior Project I & Lab

**Q12** CIT 445 Intranetworking II & Lab  
CIT 490 CASE Tools & Lab  
ECN 150 Economics I  
PMT 499 Senior Project II