Ventura College Sabbatical

Computer Science Curriculum Support

Fall 2022

Submitted by Ryan Petitfils

Mathematics/Computer Science Department

Instructor's Status: Full-Time, tenured

Hire Date: August 2013

Previous Leaves: 0

Sabbatical Taken: Fall 2022

I. Summary of the Project:

The purpose of my sabbatical project was twofold: (1) Work concurrently with the Department Chair of Math and Computer Science and Computer Science Faculty to assist in the development and design of curriculum for the Computer Science discipline which includes updating current courses, creating new courses, and developing brand new programs including: certificates of achievement, proficiency awards, Associate degrees, or Associate degrees for Transfer in Computer Science (using TMC as a model) to include in the college catalog. (2). Work concurrently with the Department chair of Math and Computer Science and English and Math and Learning Resources Division to create, or select an additional noncredit class (other than Math N101) and create of a Noncredit Certificate of Competency that may lead to enhanced funding from CDCP at the state.

II. Components of Sabbatical Project:

1. Assist Computer Science instructors and the Department Chair to conduct research and identify which courses need to be updated and which courses need to be created in order to add to the Computer Science program. Update these courses on CourseLeaf by making necessary changes, and write and propose the new CS courses on CourseLeaf.
2. Once the courses are created and approved, work with the CS instructors, Department Chair, and Ventura College as a whole to conduct research and assist in the creation of CS Programs on CourseLeaf, and work toward approving these CS programs to add to our College Catalog.

3. Assist the Department Chair and Division to add a noncredit course in CourseLeaf to a new noncredit Certificate of Competency to the Ventura College Catalog.
4. Create a noncredit Certificate of Competency which includes Math N101 and other appropriate noncredit course(s) in CourseLeaf that will allow for enhanced funding from the CDCP, to offer quality programs to our students especially those transferring with a math-related major who need a strong foundation in math before transferring.

III. Prior to the start of Sabbatical Project (January – May 2022):

1. Several items from my components listed were completed prior to my sabbatical leave. By May 2022, items 3 and 4 (above) were already implemented by the Math Department by combining IDS N100 with Math N113 to create a non-credit Mathematics Readiness Certificate of Competency. As it reads in the college catalog 2022-2023, the Mathematics Readiness Certificate of Competency is designed to facilitate learning in critical thinking and fundamental math skills, offering students a noncredit option to learn fundamental mathematical skills, including operations on integers or algebraic expressions, graphing lines, factoring polynomials, and solving systems of linear equations. Students will work through individualized learning pathways that will focus on supporting building mathematics skills for their specific career and educational needs and interests. The program is designed to be completed in a single semester and can be taken simultaneously with other credit-based and noncredit courses at the College.
    i. **Non-credit Mathematics Readiness Certificate of Competency**
    REQUIRED CORE (70.0–227.5 hours):
    MATH N113 Math Readiness for College Success 52.5
    IDS N100 Supervised Tutoring 17.5-175.0
    Total Hours 70-227.
2. Prior to starting the Sabbatical leave in August 2022, Ali Fazelpour (Full-time Computer Science Professor) and I met to discuss our goals and the curriculum we decided to create for items 1 and 2 listed in the components of my Sabbatical Project. At our initial meeting we decided to focus on the following areas:
    1. Create a Linux course CS V47 (renamed CS V45)
    2. Update 3 courses for C-ID approval – CSV11, CS V13, CS V19
    3. Create an intro to computer programming/IT careers course
    4. Create a course for IT fundamentals
    5. Create 3 Cisco courses
    6. Create 2 Cloud Computing Courses

During to my Sabbatical leave, CS V47 (renamed to CS V45) was approved by Curriculum Committee in August 2022. I helped to update this course, as well as update and submit the 3 courses CS V11, CS V13, and CS V19 to achieve C-ID approval.

3. **During my Sabbatical (August 2022 – December 2022)**

   In August 2022, Ali and I met to discuss the current courses and what to create, based on our conversations, we decided to create 7 additional courses: CS V09 Principles of Computing, CS V41 IT Fundamentals, CS V51 Cloud Computing and Virtualization Fundamentals, CS V52 Cloud Security Fundamentals, and the 3 Cisco Networking courses, CISCO CCNA Networking I, II, and III. The goal was to have the courses approved first and then create an associate degree in CS and/or certificates to offer more options for our students. Another goal was to draw in more Information Technology professionals and to start offering IT courses in Cloud Computing.

   We also decided to have an entry point for students who want to major in computing-related careers such as Information Technology, Computer Programming, and Computer Networking. Over the next 5 months, I investigated courses at other colleges offering similar courses and through exchanges with other professors at other schools and VCCCD faculty and staff, I created the curriculum for 4 NEW courses: CS V09 Principles of Computing, CS V41 IT Fundamentals, CS V51 Cloud Computing and Virtualization Fundamentals and CS V52 Cloud Security Fundamentals.

   I also entered the SLOs in the SLO database for the review cycle. Ali had already created the 3 Cisco Networking courses and CS V45 Linux Fundamentals prior to my Sabbatical leave. Additionally, Ali and I met regularly on a monthly basis and I helped to keep adrift of the curricular changes needed for CS curriculum through exchanges with the curriculum committee.

   As a result of our work, the following course offerings in CS have doubled (pending full district approval of all courses). See the list at the end of this document with course descriptions of the NEW courses.

4. **Main Accomplishments of my Sabbatical (August 2022- December 2022)**
   i. Created a vision for Computer Science offerings and programs and the future of the discipline through discussions with Ali Fazelpour

ii. Updated all C-ID and related curriculum changes for current CS courses
iii. Assisted with the curricular changes on CourseLeaf and approval of 4 NEW CS courses and SLOs: CS V45, CS V61, CS V62, CS V63
iv. Discussed CS courses and degree programs with Computer Science and Information Technology professors at Moorpark College and what courses and programs would be beneficial for our district
v. Researched other colleges which had courses and degrees in Computer Science and Information Technology, which courses were most widely offered, and what we need to do to stay current with our CS and IT courses.
vi. Created 4 NEW CS/IT courses on CourseLeaf and SLOs: CS V09, CS V41, CS V51, and CS V52 and supported these courses through the curriculum process (still pending approval from the district)

Computer Science Curriculum at Ventura College

BEFORE (8 course offerings prior to 2022)

- **CS V11 - PROGRAMMING FUNDAMENTALS**
- **CS V13 - OBJECT-ORIENTED PROGRAMMING**
- **CS V15 - DATA STRUCTURES AND ALGORITHMS**
- **CS V17 - DISCRETE STRUCTURES**
- **CS V19 - COMPUTER ARCHITECTURE AND ORGANIZATION**
- **CS V30 - BEGINNING C++**
- **CS V40 - BEGINNING JAVA**
- **CS V42 - INTERMEDIATE JAVA**

AFTER (16 course offerings, created in 2022)

- **CS V09 – PRINCIPLES OF COMPUTING**
- **CS V11 - PROGRAMMING FUNDAMENTALS**
- **CS V13 - OBJECT-ORIENTED PROGRAMMING**
- **CS V15 - DATA STRUCTURES AND ALGORITHMS**
- **CS V17 - DISCRETE STRUCTURES**

- **CS V19 - COMPUTER ARCHITECTURE AND ORGANIZATION**
- **CS V30 - BEGINNING C++**
- **CS V40 - BEGINNING JAVA**
- **CS V41 – IT FUNDAMENTALS**
- **CS V42 - INTERMEDIATE JAVA**
- **CS V45 – LINUX FUNDAMENTALS**
- **CS V51 – CLOUD COMPUTING AND VIRTUALIZATION FUNDAMENTALS**
- **CS V52 – CLOUD SECURITY FUNDAMENTALS**
- **CS V61 – CISCO CCNA NETWORKING I**
- **CS V62 – CISCO CCNA NETWORKING II**
- **CS V63 – CISCO CCNA NETWORKING III**

NEW CS COURSES COURSE DESCRIPTIONS:

CS V09 – PRINCIPLES OF COMPUTING

This course is an introduction to computing systems with an emphasis on computer science applications including computer hardware, data storage, operating systems, networking, the World Wide Web, software, digital security, an overview of computer programming languages, information systems, databases, computer graphics, software engineering, and artificial intelligence. The ethics and privacy of computer systems will also be discussed as well as careers and current events in computer technology.

CS V41 – IT FUNDAMENTALS

This course will introduce students to the basics of Information and Communication Technology (ICT) including hardware and software installation, usage, maintenance and networking. The roles and responsibilities of an ICT professional will be discussed including security and safety, troubleshooting, and customer service related to computing environments. The practice of software and hardware concepts will be practiced through hands-on lab exercises including setting up a computer, installing software and operating systems, and troubleshooting software and hardware issues. This course will prepare students to take the CompTIA A+ certification exams.

CS V45 – LINUX FUNDAMENTALS

This course provides instruction and hands-on training on the open-source Linux operating system. Students will gain knowledge about open-source software, learn how to install Linux from various media, and create and manage files and folders. Students will also perform tasks such as navigating the Linux file system, installing hardware and software, configuring file settings, administering group and user accounts, and setting up the appropriate permissions on files and folders as well. Students will learn to write shell and Python scripts using commands to automate system tasks. This course is taught using a combination of lectures, hands-on projects, demonstrations, and discussions.

CS V51 – CLOUD COMPUTING AND VIRTUALIZATION FUNDAMENTALS

This course provides an introduction to cloud computing including cloud deployment and service models, cloud infrastructure, cloud backup and storage, and key considerations for migrating to cloud computing. Students will utilize mainstream Cloud Service Providers (CSPs) such as AWS, Azure, or Google Cloud (GCP). Prepares students for the CompTIA Cloud+ certification.

CS V52 – CLOUD SECURITY FUNDAMENTALS

This course provides a broad overview of cloud security, including architectural concepts and design requirements for public, private, and hybrid clouds. Students will perform risk assessments and review of various cloud providers including a range of topics such as patch and configuration management, virtualization security, application security, automation, and change management. This course will also include a discussion of compliance and legal concerns about the governance and risk assessment of cloud IT. This course will prepare students to complete the Certified Cloud Security Professional (CCSP) exam.

CS V61 – CISCO CCNA NETWORKING I

This course introduces the Open Systems Interconnection (OSI) networking reference model, networking industry standards, networking topologies and medium, numbering systems, IP addressing and subnetting. It covers how networks operate and introduces the basic configurations for routers, switches, and wireless access points. The course content is based on the material from the CISCO Network Academy. This is the first of three courses that prepares a student for the CCNA (Cisco Certified Network Associate) Certification Exam.

CS V62 – CISCO CCNA NETWORKING II

This course provides intermediate-level instruction on routing and LAN (local area network) switching, VLANs (virtual local area networks), routing protocols, access control lists (ACLs), and network management. It covers WANs (wide area networks), WANs design, virtual private networking, and network management. Students learn how to deploy a variety of security best practices, and includes automation and programming of network services. The course content is based on the material from the CISCO Network Academy. This course along with the others prepare students for the CCNA (Cisco Certified Network Associate) Certification Exam.

CS V63 – CISCO CCNA NETWORKING III

This third and last course in the Cisco Certified Networking Associate (CCNA) curriculum provides students with knowledge and skills to describe the architecture, components, operations, and security of large networks. It covers routing protocols, access control list (ACL), network address translation (NAT), wide area network (WAN), WAN designs, virtual private network (VPN), and network management tools. Students learn how to deploy a variety of security best practices including network virtualization, software defined network (SDN), and network automation to program network services. The course content is based on the material from the CISCO Network Academy. This course along with the others prepare students for the CCNA (Cisco Certified Network Associate) Certification Exam.