Approved Innovative Course

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Course: Internetworking Technologies II
PEIMS Code: N1302804
Abbreviation: INTNET2
Grade Level(s): 10-12
Number of Credits: 1.0

Course description:

The Internetworking Technologies *2* course is normally comprised of the courses called Cisco CCNA R&S: *Scaling Networks* (CCNA *3*) and Cisco CCNA R&S: *Connecting Networks* (*CCNA 4)* The *CCNA 3* course covers the architecture, components, and operations of routers and switches in larger and more complex networks. Students learn how to configure routers and switches for advanced functionality. The CCNA 4 course discusses the Wide Area Network (WAN) technologies and network services required by converged applications in a complex network. The course enables students to understand the selection criteria of network devices and WAN technologies to meet network requirements.

Essential knowledge and skills:

(a) General requirements. This course is recommended for students in Grades 10-12. Required prerequisite: Internetworking Technologies I

(b) Introduction:

(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.

(2) The Information Technology (IT) Career Cluster focuses on building linkages in IT occupations for entry level, technical, and professional careers related to the design, development, support, and management of hardware, software, multimedia, and systems integration services.

(3) In Internetworking Technologies II, students will obtain the necessary skills to compete in the global economy. Students will learn hands-on technical skills to help them prepare for IT careers as well as post-secondary IT-related degrees. This course provides students with practical skills in networking.

(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.

(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.

(c) Knowledge and Skills.

(1) The student demonstrates the necessary skills for career development, maintenance of employability, and successful completion of course outcomes. The student is expected to:

(A) identify and demonstrate positive work behaviors that enhance employability and job advancement such as regular attendance, promptness, attention to proper attire, maintenance of a clean and safe work environment, appropriate voice, and pride in work;

(B) identify and demonstrate positive personal qualities such as flexibility, open-mindedness, initiative, listening attentively to speakers, and willingness to learn new knowledge and skills;

(C) employ effective reading and writing skills;

(D) solve problems and think critically;

(E) demonstrate leadership skills and function effectively as a team member;

(F) identify and implement proper safety procedures;

(G) demonstrate an understanding of legal and ethical responsibilities in relation to the field of information technology; and

(H) demonstrate planning and time-management skills.

(2) The student identifies various employment opportunities in the information technology field. The student is expected to:

(A) improve on a personal career plan along with education, job skills, and experience necessary to achieve career goals;

(B) update or develop a resume and/or portfolio appropriate to chosen career plan, including letters of recommendation; and

(C) illustrate interview skills for successful job placement.

(3) The student applies communication, mathematics, English language arts, and science knowledge and skills to research and develop projects. The student is expected to:

(A) demonstrate proper use of written, verbal, and visual communication techniques consistent with networking industry standards;

(B) demonstrate proper use of mathematics concepts in the development of networking technologies;

(C) demonstrate proper use of science principles in the development of networking technologies.

(4) The student configures, verifies, and troubleshoots advanced switching. The student is expected to:

(A) describe enhanced switching technologies;

(B) configure, verify, and troubleshoot Spanning Tree versions;

(C) interpret the output of various show and debug commands to verify the operational status of a Cisco switched network; and

(D) implement basic switch security.

(5) The student configures, verifies, and troubleshoots advanced routing. The student is expected to:

(A) compare and contrast advanced routing protocols Enhanced Interior Gateway Routing Protocol (EIGRP) and Open Shortest Path First (OSPF);

(B) configure, verify, and troubleshoot routing protocols;

(C) troubleshoot routing implementation issues;

(D) verify router hardware and software operation using SHOW & DEBUG commands;

(E) manage Internetwork Operating System (IOS) files and licensing; and implement router security.

(6) The student implements and verifies Wide Area Network (WAN) links. The student is expected to:

(A) describe different methods for connecting to a WAN;

(B) configure and verify a basic WAN serial connection;

(C) configure and verify Point-to-Point Protocol (PPP);

(D) configure and verify Frame Relay; and

(E) implement and troubleshoot Point-to-Point Protocol over Ethernet (PPPoE).

(7) The student troubleshoots switching and routing networks. the student is expected to:

(A) analyze and implement proper troubleshooting methods;

(B) identify and correct switching and routing network problems;

(C) identify and select software troubleshooting tools;

(D) identify and correct routing protocol issues; and

(E) identify and correct WAN issues.

Description of specific student needs this course is designed to meet:

The CCNA Routing and Switching curriculum is a gateway to entry-level networking jobs and IT careers. The curriculum consists of 2, 70-hour courses: Scaling Networks and Connecting Networks. These 2 courses prepare you for the Cisco ICND2 certification exam. Both the Internetworking Technologies 1 and Internetworking Technologies 2 courses are recommended before taking the Cisco CCNA Routing and Switching certification exam.

The CCNA Routing & Switching curriculum helps students develop workforce readiness skills and builds a foundation for success in networking-related careers and degree programs.

Major resources and materials:

Cisco Networking Academy
https://netacad.com
The Cisco Learning Network
https://learningnetwork.cisco.com

Recommended course activities:

All resources and materials are available from Cisco and Cisco Learning through the Cisco Networking Academy at http://netacad.com. All activities including: curriculum,

hands-on labs, tests, Packet Tracer labs, study guides, and reviews are available to all instructors and students.

Suggested methods for evaluating student outcomes:

Chapter tests, quizzes, worksheets, hands-on labs, and Packet Tracer labs are available for every chapter throughout the curriculum. At the completion of this course, students may be prepared to take the Cisco CCNA (ICND2) certification exam.

Teacher qualifications:

An assignment for Internetworking Technologies I or II is allowed with one of the following certificates.

(1) Any business or office education certificate.

(2) Business and Finance: Grades 6-12.

(3) Business Education: Grades 6-12.

(4) Secondary Industrial Arts (Grades 6-12).

(5) Secondary Industrial Technology (Grades 6-12).

(6) Technology Education: Grades 6-12.

(7) Technology Applications: Early Childhood-Grade 12.

(8) Technology Applications: Grades 8-12.

(9) Trade and Industrial Education: Grades 6-12. This assignment requires appropriate work approval.

(10) Trade and Industrial Education: Grades 8-12. This assignment requires appropriate work approval.

(11) Vocational Trades and Industry. This assignment requires appropriate work approval.

(12) Computer Science: Grades 8-12.

(13) Secondary Computer Information Systems (Grades 6-12)

Additional information:

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