



**I. COURSE DESCRIPTION:**

This course continues the preparation for certification in the Cisco Certified Networking Associate (CCNA) program. The student will study router configuration and routed/routing protocols. Practical exercises in router configuration and IP addressing are very important components of this course.

**Rationale:**

The CCNA curriculum is extensive and beyond the domain of a single course. Two additional Network Certification courses will further the students progress towards full certification. The four courses are referred to by Cisco as CCNA1 - 4. The courses themselves do not result in CCNA certification; one formal exam must be taken at a Prometric™ Testing Centre at the student's own expense upon completion of the four courses.

**II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:**

Upon successful completion of this course, the student will demonstrate the ability to:

**1. Describe the components and operation of a router.**Potential Elements of the Performance:

- List the components of a router and describe their purpose.
- Describe how routing occurs, using IP as the routed protocol.
- Describe the operation of a router in a WAN and LAN.

*This learning outcome will constitute approximately 20% of the course. Reference: Module 1,2*

**2. Configure routers to be used in both WANS and LANS.**Potential Elements of the Performance:

- List and describe the various IOS user and privileged mode commands.
- Configure a router from its default condition to become a functioning router in an internetwork.
- Configure a router for both static and dynamic routing table updates.
- Perform various tests in order to verify the operation of the routers in a network.
- Configure a router and server to download the routers configuration and image from a TFTP server.
- Troubleshoot various network problems.

*This learning outcome will constitute approximately 40% of the course. Reference: Module 3-5*

**3. Describe the characteristics of various routing and control protocols such as RIP, OSPF and ICMP.**

Potential Elements of the Performance:

- Describe why routing protocols are necessary.
- Describe the characteristics of link state (LS) and distance vector (DV) and hybrid routing protocols.
- Identify the advantages and disadvantages of LS and DV routing protocols.
- Describe the characteristics of the ICMP – Internet Control Message Protocol and identify the variety of ICMP messages in networks today.
- Determine the causes for ICMP messages.

*This learning outcome will constitute approximately 15% of the course. Reference: Module 6,7*

**4. Produce Access Control lists to control network traffic.**

Potential Elements of the Performance:

- Describe the differences between standard and extended Access Control Lists (ACLs).
- Explain the rules for placement of ACLs.
- Create and apply named ACLs.
- Describe the function of firewalls.
- Use ACLs to restrict virtual terminal access.

*This learning outcome will constitute approximately 15% of the course. Reference: Module 11*

**5. Build and troubleshoot networks.**

Potential Elements of the Performance:

- Connect routers using both LAN and WAN interfaces to build internetworks to satisfy particular requirements.
- Configure the routers and assign appropriate IP addresses.
- Troubleshoot various faults within the networks.

*This learning outcome will constitute approximately 10% of the course. Reference: Module 8-11*

**III. TOPICS:**

1. Router components and configuration
2. IOS images and backup of system files
3. Routing protocols
4. Network Troubleshooting
5. Access Control Lists

**IV. REQUIRED RESOURCES/TEXTS/MATERIALS:**

Optional Textbook: CCNA 1&2 Companion Guide 3<sup>rd</sup> Edition **Revised**, Cisco Press

ISBN: 1-58713-150-1

**V. EVALUATION PROCESS/GRADING SYSTEM:****Theory:**

Online Cisco Module exams	35%
Online Final Cisco Exam	25%

**Lab:**

Practical Test	20%
Lab Activities	20%

**Notes:**

- It is necessary to attain a grade of 60% on the final Cisco Exam in order to proceed to the next Cisco Certification Course.
- Online Cisco exams must be written in class during class time. It is unacceptable to print or otherwise copy any of the online Cisco exams.
- Minor modifications to the evaluation scheme may be made during the semester to accurately reflect changes in emphasis.

The following semester grades will be assigned to students in postsecondary courses:

<u>Grade</u>	<u>Definition</u>	<u>Grade Point Equivalent</u>
A+	90 – 100%	4.00
A	80 – 89%	3.00
B	70 - 79%	3.00
C	60 - 69%	2.00
D	50 - 59%	1.00
F (Fail)	49% or below	0.00

CR (Credit)	Credit for diploma requirements has been awarded.
S	Satisfactory achievement in field placement or non-graded subject areas.
U	Unsatisfactory achievement in field placement or non-graded subject areas.
X	A temporary grade. This is used in limited situations with extenuating circumstances giving a student additional time to complete the requirements for a course (see <i>Policies &amp; Procedures Manual – Deferred Grades and Make-up</i> ).
NR	Grade not reported to Registrar's office. This is used to facilitate transcript preparation when, for extenuating circumstances, it has not been possible for the faculty member to report grades.

### **UPGRADING OF INCOMPLETES**

When a student's course work is incomplete or final grade is below 50%, there is the possibility of upgrading to a pass when a student meets all of the following criteria:

1. The student's attendance has been satisfactory.
2. An overall average of at least 45% has been achieved by semester's end.
3. The student has made reasonable efforts to participate in class and maintain the recommended schedule for assigned activities.

The nature of the upgrading requirements will be determined by the instructor and may involve re-testing and/or additional lab assignments

### **ATTENDANCE:**

Absenteeism will affect a student's ability to succeed in this course. Absences due to medical or other unavoidable circumstances should be discussed with the instructor.

## **VI. SPECIAL NOTES:**

### Special Needs:

If you are a student with special needs (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your professor and/or the Special Needs office. Visit Room E1101 or call Extension 2493 so that support services can be arranged for you.

Retention of course outlines:

It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other postsecondary institutions.

Plagiarism:

Students should refer to the definition of “academic dishonesty” in *Student Rights and Responsibilities*. Students who engage in “academic dishonesty” will receive an automatic failure for that submission and/or such other penalty, up to and including expulsion from the course/program, as may be decided by the professor/dean. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

Course outline amendments:

The Professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.

Substitute course information is available in the Registrar's office.

**VII PRIOR LEARNING ASSESSMENT:**

Students who wish to apply for advanced credit in the course should consult the professor. This course is eligible for challenge or credit transfer if CCNA accreditation has been achieved or Cisco Network Academy Semester 2 credit can be proven with a grade of 60% or better on a recent version of the final exam. Satisfactory completion of a practical test may also be required.

**VIII. DIRECT CREDIT TRANSFERS:**

Students who wish to apply for direct credit transfer (advanced standing) should obtain a direct credit transfer form from the Dean's secretary. Students will be required to provide a transcript and course outline related to the course in question.