North Central Michigan College
Master Course Syllabus

PART 1:

Course Name: Advanced Hardware and Routing

Course Number: IT 160

Credit Hrs. 3 Lecture Hrs. 3 Lab Hrs. 0 Clinical Hrs. 0 Variable Hrs. 0

Total Hours of Instruction: 3 Total Contact Hours: 52.8
(Total Contact hour's formula: (lecture hrs. + lab hrs. + clinical hrs) x 17.6)

Course Description:
Students will perform router and switch configurations on a LAN and WAN network in a mixed hardware and virtual environment, as well as basic configuration procedures to build a multirouter, multigroup internetwork that uses LAN and WAN interfaces for the most commonly used routing and routed protocols. This course will help prepare the student for the Cisco CCNA Certification Examination.

Prerequisite (s): IT 102 or instructor approval
Co-requisite (s): None

Course Objectives:
The learner will be able to:

- Install and Configure Cisco Routers and Switches in Multiprotocol Networks.
- Identify Components and Functions of the OSI Model.
- Configure Basic Operation of Cisco IOS Software.
- Configure a Router and Switch from Command Line Interface.
- Use System Files to Learn About Neighboring Devices.
- Configure the Catalyst Switch.
- Extend Switched Networks with Virtual LANs (VLANs).
- Interconnect Networks Using TCP/IP.
- Determine IP Routes with routing protocols.
- Configure IP Access Lists.
- Connect to Frame Relay Services.
- Configure Serial Connections on a WAN interface.
- Install and configure multiple hard drives.
- Install and configure multiple network adapters.

Reasonable accommodations can be provided for students with documented disabilities. Please contact Learning Support Services to arrange for these (231)348-6687 or (231)348-6817, Room 533 SCRC.

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PART 2:

Course Objectives and Linked Lumina DQP Outcomes
*See **PART 3** of this syllabus for the complete language of each Lumina DQP outcome.*

*Please identify the Lumina DQP outcome(s) supported by the course objectives. List each course objectives (from **PART 1**), followed by the corresponding Lumina DQP Outcome number(s) in parentheses. (See the example.)*

Example:
- *Course Objective (DQP # 1, 5, 8)*

- Install and Configure Cisco Routers and Switches in Multiprotocol Networks. (DQP 3)
- Identify Components and Functions of the OSI Model. (DQP 3)
- Configure Basic Operation of Cisco IOS Software. (DQP 3)
- Configure a Router and Switch from Command Line Interface. (DQP 3)
- Use System Files to Learn About Neighboring Devices. (DQP 3)
- Configure the Catalyst Switch. (DQP 3)
- Extend Switched Networks with Virtual LANs (VLANs). (DQP 3)
- Interconnect Networks Using TCP/IP. (DQP 3, 13)
- Determine IP Routes with routing protocols. (DQP 3, 13)
- Configure IP Access Lists. (DQP 3, 13)
- Connect to Frame Relay Services. (DQP 3)
- Configure Serial Connections on a WAN interface. (DQP 3)
- Install and configure multiple hard drives. (DQP 3)
- Install and configure multiple network adapters. (DQP 3)

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Suggested Methods of Instruction:
This course will be completed as an instructor directed self-study using laboratory exercises coinciding with assigned readings and online supplemental study aids.

Suggested Methods of Assessment and Evaluation:
Quizzes, papers, third party evaluations, oral report and lab work.

Adopted Text at Time of Course Adoption/Revision:
To be determined by instructor.

Topics Covered During the Semester:
Sequence of topics and time allowance are at the discretion of the instructor

The following is a tentative schedule based on individual student needs. The instructor reserves the right to make any schedule changes deemed necessary and assign online supplemental activities as necessary. The entire sequence must be completed by the end of the calendar semester. Laboratory access is limited to 12 hours per week for this course. The following topics will be covered.

Week 1	Internetworking Concepts
Week 2	Operating and Configuring a Basic Operation of Cisco IOS Software
Week 3	Managing Your Network Environment
Week 4	Catalyst 1900 Switch Operations
Week 5	Extending Switched Networks with Virtual LANs
Week 6	Interconnecting Networks with TCP/IP
Week 7	Determining IP Routes
Week 8	IP Traffic Management with Access Lists
Week 9	Configuring Novell IPX
Week 10	Establishing Serial Point-To-Point Connections
Week 11	Completing an ISDN BRI Call
Week 12	Establishing a Frame Relay PVC Connection
Week 13	Multiple hard drives
Week 14	Multiple NICs
Week 15	Contemporary server technologies

Lab 1:	Assemble and Cable Cisco Devices
Lab 2:	Cisco Router Startup and Initial Configuration
Lab 3:	Switch startup and initial configuration
Lab 4:	Using the Router Command Line Interface
Lab 5:	Router and Network Examination
Lab 6:	Operate and Configure an IOS Device
Lab 7:	Using a TFTP Server
Lab 8:	Get Information About Neighboring Devices and Using System Files
Lab 9:	Password Recovery

Lab 10: Remote Configuration
Lab 11: Configure the Switch
Lab 12: Configure a Switch for Extended Functionality
Lab 13: Interconnect Networks with TCP/IP
Lab 14: Determine IP Routes with RIP
Lab 15: Determine IP Routes with IGRP
Lab 16: Create IP Access Lists
Lab 17: VTY Access Lists
Lab 18: Enable IPX Routing Protocol on a Router
Lab 19: Configure an extended Access List
Lab 20: Configure Serial Connections to WAN Service Providers
Lab 21: Complete WIC configuration
Lab 22: Connect to Frame Relay Services
Lab 23: Add and configure multiple hard drives
Lab 24: Add and configure multiple NICs

All labs must be reported as a short description of the work done in a professional style formatted letter to receive credit for the lab.
Three quizzes, one oral examination and a written final examination will be required.

Part 1 & Part 2 approved by CRDAP on: 05 01 15	
Part 2 approved by AD:	Date:
Part 2 approved by CRDAP Chair:	Date:

Rev02/15

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PART 3:

LUMINA DQP OUTCOMES – *Use this reference sheet for **PART 2** of Master Course Syllabus.*

Specialized Knowledge

1. Describes the scope and principal features of the field of study, citing at least some of its core theories and practices and offers a similar explication of at least one related field.
2. Illustrates contemporary terminology used in the field.
3. Generates substantially error-free products, reconstructions, data, juried exhibits or performances as appropriate to the field.

Broad Integrative Knowledge

4. Describes how existing knowledge or practice is advanced, tested and revised
5. Describes and examines a range of perspectives on key debates and their significance both within the field and in society.
6. Illustrates core concepts of the field while executing analytical, practical or creative tasks.
7. Selects and applies recognized methods of the field in interpreting characteristic discipline-based problems.
8. Assembles evidence relevant to characteristic problems in the field, describes the significance of the evidence and uses the evidence in analysis of these problems.
9. Describes the ways in which at least two disciplines define, address and interpret the importance of a contemporary challenge or problem in science, the arts, society, human services, economic life or technology.

Intellectual Skills – Analytic Inquiry

10. Identifies, categorizes and distinguishes among elements of ideas, concepts, theories and/or practical approaches to standard problems.

Intellectual Skills – Use of Information Resources

11. Identifies, categorizes, evaluates and cites multiple information resources necessary to engage in projects, papers or performance in his or her program.

Intellectual Skills – Engaging Diverse Perspectives

12. Describes how knowledge from different cultural perspectives would affect his or her interpretations of prominent problems in politics, society, the arts and/or global relations.

Intellectual Skills – Communication Fluency

13. Presents accurate calculations and symbolic operations and explains how such calculations and operations are used in either his or her specific field of study or in interpreting social and economic trends.
14. Presents substantially error-free prose in both argumentative and narrative forms to general and specialized audiences.

Applied Learning

15. Describes in writing at least one substantial case in which knowledge and skills acquired in academic settings are applied to a challenge in a non-academic setting; applies that learning to the question; and analyzes at least one significant concept or method related to his or her course of study in light of learning outside the classroom.
16. Locates, gathers and organizes evidence on an assigned research topic addressing a course-related question or a question of practice in a work or community setting; offers and examines competing hypotheses in answering the question.

Civic Learning

17. Describes his or her own civic and cultural background, including its origins and development, assumptions and predispositions.
18. Describes diverse positions, historical and contemporary, on selected democratic values or practices and presents his or her own position on a specific problem where one or more of these values or practices are involved.
19. Takes an active role in a community context (work, service, co-curricular activities, etc.) and examines the civic issues encountered and the insights gained from the community experience.

The Degree Qualifications Profile was adopted by CRDAP: April 11, 2012