San Bernardino Valley College
Curriculum Approved: November 8, 2004

I. COURSE INFORMATION:

A. Division: Technical
Department: Electricity/Electronics
Course ID: ELECTR 255B
Course Title: Telephone and Data Networking
Units: 4
Lecture: 3 hours
Laboratory: 3 hours
Prerequisite: ELECTR 115 and ELECTR 116
Corequisite: None
Dept. Advisory: None

B. Catalog Description: Course includes telephone topology with emphasis on the Open System Interconnection (OSI) model, telephony color code, tools, patch panels, phone wiring and installation, voice and data block wiring, installation, and programming/troubleshooting a digital key system and network.

C. Schedule Description: Telephone and Data Networking, TCP/IP fundamentals

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: One

III. EXPECTED OUTCOMES:

Upon successful completion of the course, the student should be able to:

A. Use the telephony color code while wiring a single line phone.
B. Work with telephone power supplies and specialty tools.
C. Troubleshoot a single line phone system.
D. Discuss bandwidth and signal transmission.
E. Comprehend modem, DSL, fiber, and ISDN.
F. Define OSI and Physical Layer.

IV. COURSE CONTENT:

A. Introduction.
   1. Telephony color code
   2. Data applications
   3. Tools
B. Power Supplies
   1. Transformers
   2. Rectifiers
   3. Filters
   4. Regulators
C. Wiring
   1. Wiring of the 25 pair
   2. Wiring other connector blocks
   3. Wiring a single line phone
   4. Key system block wiring
D. Business Applications
   1. Concept of the single line phone
   2. Office telephone features
   3. Volume
   4. Background music
   5. Intercom calls
   6. PBX/Centrex transfer
   7. Camp on
   8. Leaving message waiting
   9. Answer message waiting
   10. Call transfer

11. Conference combinations
12. Queuing
13. Speed numbers

E. Schematic Reading
F. Digital Key Systems
1. Introduction
2. Installation of a digital key system
3. Customer data base programming
4. Station configuration
5. CO line configuration
6. System configuration
7. Database printout

G. System Checkout Procedures
1. Functional test procedures
2. Preliminary checklist

H. Maintenance and Troubleshooting
1. Preventive maintenance
2. Fault classification
3. System failures
4. Power failures
5. Key telephone failures
6. CO/PBX line failures
7. Feature operation failures

V. METHODS OF INSTRUCTION: (Please check all that apply and add any additional not listed.)

X Lecture
X Class and/or small group discussion
_____ Critical evaluation of texts, newspapers, journal articles, and other printed research
_____ Critical evaluation of films, videotapes, audiotapes, or other media forms
_____ Classroom demonstrations
_____ Field trips
_____ Guest speakers
_____ Other:
_____ Other:
_____ Other:

VI. TYPICAL OUT-OF-CLASS ASSIGNMENTS:

A. Reading Assignment. Reading assignments are required and may include (but are not limited to) the following: After reading the chapter on Digital Key Systems, discuss in small groups the installation of a digital key system.
B. Writing Assignment. Writing assignments are required and may include (but are not limited to) the following: Write practical lab summaries with conclusions.
C. Critical Thinking Assignment. Critical thinking assignments are required and may include (but are not limited to) the following:
1. Wire up a single line phone and write down the procedure.
2. Wire 25 pair to a 66B block.

VII. EVALUATION:

A student's grade will be based on multiple measures of performance and will reflect the objectives explained above. A final grade of "C" or better should indicate that the student has the ability to successfully apply the principles and techniques taught in this course. These evaluation methods may include, but are not limited to, the following (Please check all that apply, and add additional ones not listed):

_____ Portfolios
_____ Projects

X Written papers or reports
_____ Presentations (oral and visual)
_____ Work performance (internships or field work)
_____ Lab work
X Comprehensive examinations (cumulative finals or certifications)
_____ Peer evaluation
_____ Self evaluation
_____ Classroom participation
_____ Homework
X Other: Practical lab projects
_____ Other:
_____ Other:

VIII. TYPICAL TEXTS:

A. Shrader, R. L., Electronic Communication, 6th Edition, Glenco, New York, 2000
B. Telecommunications Trainer Lab Manual Model TCM 100, RSR Electronics, Inc., 1998
C. Elahi, Network Communications Technology, Delmar, New York, 2001

IX. OTHER SUPPLIES REQUIRED OF STUDENTS:

Scientific calculator

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PREREQUISITE/COREQUISITE/ADVISORY
COURSE GRID FORM

Target Course: ELECTR 255B Telephone and Data Networking

Prerequisite Course: ELECTR 115 Alternating Current Circuit Analysis

Instructions:
1) List exit competencies (skills) from Prerequisite Course. These skills are listed in the "Student Outcomes" section of the Course Outline ("upon completion of the course, the student should be able to…")
2) Indicate which of the listed exit competencies (skills) are necessary entry skills needed for success in the target course. Mark with an "X" each needed skill.
3) Indicate the degree of importance of each needed entry skill for course success, using the following rating scale:

1=Critical 2=Very Helpful 3=Desirable

Skills Analysis

Entry Skills in Target Course	Exit Skills Provided by Prerequisite Course (Mark with an X if needed and indicate Prerequisite Course if more than one).	Degree of Importance (Rate 1 – 3)
1. Define magnetism, electromagnetism, and electromagnetic induction.	X	1
2. Explain the generation of AC voltage from electro-mechanical generators.	X	1
3. Define reactance; inductive/capacitive, units of measurement, their source, and their relation to resonance.	X	1
4. Describe the interaction between volts, ohms, current, and frequency in AC series and parallel circuits.	X	1
5. Apply circuit analysis to series and parallel and complex circuits.	X	1
6. Use rectangular and polar number systems, in series and parallel variational analysis.	X	1
7. Distinguish between half-wave, full-wave, and bridge rectifier circuits.	X	1
8. Analyze the filtering process of an LC pi filter network.	X	1

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COURSE GRID FORM

Target Course: ELECTR 255B Telephone and Data Networking

Prerequisite Course: ELECTR 116 Alternating Current Circuit Laboratory

Instructions:

1) List exit competencies (skills) from Prerequisite Course. These skills are listed in the "Student Outcomes" section of the Course Outline ("upon completion of the course, the student should be able to…")
2) Indicate which of the listed exit competencies (skills) are necessary entry skills needed for success in the target course. Mark with an "X" each needed skill.
3) Indicate the degree of importance of each needed entry skill for course success, using the following rating scale:

1=Critical 2=Very Helpful 3=Desirable

Skills Analysis

Entry Skills in Target Course	Exit Skills Provided by Prerequisite Course (Mark with an X if needed and indicate Prerequisite Course if more than one).	Degree of Importance (Rate 1 – 3)
1. Explain the oscilloscopes operation and controls and be able to use it to measure voltage and time.	X	1
2. Use the function generators operation and controls.	X	1
3. Explain the layout of a QT board and be able to construct circuits on it.	X	1
4. Use a multi-meter to measure voltage, check for continuity, and verify polarity.	X	1
5. Describe electrical safety procedures.	X	1