

BROWARD COLLEGE COURSE OUTLINE

Last Review: 03/01/2016

Next Review: 08/01/2020

COURSE TITLE: COLLEGE ALGEBRA

COMMON COURSE NUMBER: MAC1105

EFFECTIVE TERM: Fall 2016

CREDIT HOURS: 3

CONTACT HOUR BREAKDOWN

(per 16 week term)

Lecture: 48

Lab:

Clinic:

Other:

College Placement Testing Requirements

Passing Placement Tests score(s) in the following area(s) is/are required:

- Math

Prerequisite

None

Corequisite

None

Pre/Corequisite

None

COURSE DESCRIPTION: A college algebra course containing topics such as solving, graphing and applying linear and quadratic equations and inequalities; exponential and logarithmic properties; linear, quadratic, rational, absolute value, square root, cubic, and reciprocal functions operations, compositions, and inverses of functions; and systems of equations and inequalities, all with applications throughout the course. Recommendation of the Mathematics Department or at least a grade of C in the prerequisite course required.

MEETS THE FOLLOWING GENERAL EDUCATION REQUIREMENTS

AA and Baccalaureate Degrees, meets Area(s):

AA/Bac-Area 5: Mathematics

AS Degree, meets Area(s):

AS-Area 5: Mathematics

AAS Degree, meets Area(s):

AAS-Area 4: Mathematics/Science

AAS-Area 5: Program-Designated Courses

UNIT TITLES

1. Selected Topics in Algebra
2. Equations and Inequalities
3. Relations, Functions, and Graphs
4. Exponential and Logarithmic Properties, Functions, and Equations
5. Systems of Linear Equations and Inequalities

EVALUATION:

This course will assess through a variety of methods such as group projects, multiple choice tests, pop quizzes, take home tests, short answer tests or other methods as deemed appropriate by the instructor.

| | |
|------------------|--|
| Portfolio | |
| Short Essay | |
| Research Project | |

| | | |
|----------------------------------|--|--|
| Group Projects | | |
| Discussion | | |
| Multiple Choice Tests | | |
| Presentations | | |
| Service Learning Projects | | |
| Pop Quizzes | | |
| Take Home Tests | | |
| Summaries and Critiques | | |
| Reaction Papers | | |
| Surveys | | |
| Performance | | |
| Short Answer Tests | | |
| Class Room Debates and Colloquia | | |
| Blog, Wikis, Webpages | | |
| Other | | |

GENERAL EDUCATION Competencies and Skills:

| | |
|--|-------------------------|
| 1. Critical Thinking | 1.0, 2.0, 3.0, 4.0, 5.0 |
| 2. Communicate Effectively | 1.0, 2.0, 3.0, 4.0, 5.0 |
| 3. Ethical Reasoning | |
| 4. Global Self-Awareness | |
| 5. Information Literacy | 2.0, 3.0, 4.0, 5.0 |
| 6. Mathematical and Scientific Reasoning | 1.0, 2.0, 3.0, 4.0, 5.0 |

UNITS

Unit 1 Selected Topics in Algebra

General Outcome

- 1.0 Work with algebraic concepts.

Specific Learning Outcomes

- 1.1 Perform operations on rational expressions including complex fractions.
 1.2 Perform long division of polynomials.
 1.3 Perform operations with complex numbers.
 1.4 Graph linear inequalities in two variables.

Unit 2 Equations and Inequalities

General Outcome

- 2.0 Solve radical, rational, and quadratic equations. The students shall be able to solve radical, quadratic, and absolute value inequalities.

Specific Learning Outcomes

- 2.1 Solve quadratic equations in one variable by factoring, using the square root property, completing the square, and using the quadratic formula.
- 2.2 Analyze the discriminant to determine the nature of solutions.
- 2.3 Read and solve applied problems.
- 2.4 Solve rational equations, equations quadratic in form, and radical equations including, but not limited to, those requiring double-squaring.
- 2.5 Solve quadratic inequalities in one variable, graph the solution set, and express the solution set using interval notation.
- 2.6 Solve inequalities that involve absolute value in a single variable, graph the solution sets, and express the solution set using interval notation.
- 2.7 Solve inequalities that involve rational expressions, graph the solution sets, and express the solution set using interval notation.

Unit 3 Relations, Functions, and GraphsGeneral Outcome

- 3.0 Work with relations, functions, and their graphs.

Specific Learning Outcomes

- 3.1 Determine if a given relation is a function.
- 3.2 Evaluate a given function using function notation.
- 3.3 Determine the difference quotient.
- 3.4 Determine the domain and range of a relation or function.
- 3.5 Determine if a function is even or odd.
- 3.6 Determine the vertex and axis of symmetry of quadratic equations and sketch their graphs.
- 3.7 Determine x- and y- intercepts.
- 3.8 Read and solve maximum/minimum problems.
- 3.9 Graph quadratic, absolute value, square root, cubic functions, and the reciprocal function using symmetry, shifting, stretching, compressing, and/or reflecting.
- 3.10 Evaluate and graph piecewise-defined functions.
- 3.11 Add, subtract, multiply, and divide two functions.
- 3.12 Determine the compositions of two functions.
- 3.13 Determine if a function is one-to-one.
- 3.14 Determine the inverse of a one-to-one function.
- 3.15 Graph a function and its inverse.
- 3.16 Determine the type(s) of symmetry exhibited by a given relation.
- 3.17 Determine the center and radius of a circle and sketch its graph.
- 3.18 Use and apply the midpoint and distance formulas.

Unit 4 Exponential and Logarithmic Properties, Functions, and EquationsGeneral Outcome

- 4.0 Solve and graph logarithmic equations/functions and exponential equations/functions.

Specific Learning Outcomes

- 4.1 Define exponential and logarithmic functions.
- 4.2 Convert a logarithmic equation to exponential form and vice-versa.
- 4.3 Simplify and evaluate expressions using the properties of logarithms, including change of base.
- 4.4 Solve exponential equations (same and different bases).
- 4.5 Graph exponential and logarithmic functions using shifting, stretching, compressing, and reflecting.
- 4.6 Read and solve applied problems including, but not limited to, compound interest and exponential growth and decay.
- 4.7 Solve logarithmic equations.

Unit 5 Systems of Linear Equations and Inequalities

General Outcome

- 5.0 Solve systems of linear equations and inequalities.

Specific Learning Outcomes

- 5.1 Solve a linear system of equations in two and three variables using algebraic methods.
- 5.2 Classify a linear system of equations (in two and three variables) as consistent or inconsistent. If the system is consistent, determine whether the equations are dependent or independent.
- 5.3 Read and solve word problems by modeling them with systems of linear equations.
- 5.4 Solve a linear system of inequalities by graphing.

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BROWARD COLLEGE COURSE OUTLINE

Last Review: 08/01/2010

Next Review: 08/01/2015

COURSE TITLE: ENVIRONMENTAL SCIENCE

COMMON COURSE NUMBER: EVR1009

EFFECTIVE TERM:

CREDIT HOURS: 3

CONTACT HOUR BREAKDOWN

(per 16 week term)

Lecture: 48

Lab: 0

Clinic: 0

Other: 0

College Placement Testing Requirements

N/A

Prerequisite

None

Corequisite

None

Pre/Corequisite

None

COURSE DESCRIPTION: Study of the physical environment, its relationship with the biosphere, and man's impact upon natural systems. Placement by Testing Department.

MEETS THE FOLLOWING GENERAL EDUCATION REQUIREMENTS

AA and Baccalaureate Degrees, meets Area(s):

AA/Bac-Area 4a: Biological Sciences

AA/Bac-Area 4b: Physical Sciences

AS Degree, meets Area(s):

AS-Area 4: Natural Sciences

AAS Degree, meets Area(s):

AAS-Area 4: Mathematics/Science

AAS-Area 5: Program-Designated Courses

UNIT TITLES

1. Reading and Writing in the Biological Sciences
2. Physical Factors and the Environment
3. Water in Natural Systems
4. Ecosystems
5. Geology of Florida
6. Weather and the Environment
7. Ecosystems of Florida
8. The Ocean
9. Energy and the Environment
10. Sustainable Solutions

EVALUATION:

| | |
|------------------|------------|
| Portfolio | 10.0 |
| Short Essay | 2.0 - 9.0 |
| Research Project | 1.0 - 10.0 |

| | |
|----------------------------------|------------------------------|
| Group Projects | 2.0, 3.0, 4.0, 6.0, 7.0, 9.0 |
| Discussion | 2.0 - 10.0 |
| Multiple Choice Tests | 1.0 - 10.0 |
| Presentations | 2.0 - 10.0 |
| Service Learning Projects | 9.0 - 10.0 |
| Pop Quizzes | 2.0 - 10.0 |
| Take Home Tests | 1.0 - 10.0 |
| Summaries and Critiques | 1.0 - 10.0 |
| Reaction Papers | |
| Surveys | 3.0; 9.0 - 10.0 |
| Performance | |
| Short Answer Tests | 1.0 - 10.0 |
| Class Room Debates and Colloquia | |
| Blog, Wikis, Webpages | 1.0 - 10.0 |
| Other | |

GENERAL EDUCATION Competencies and Skills:

| | |
|--|--|
| 1. Critical Thinking | |
| 2. Communicate Effectively | |
| 3. Ethical Reasoning | |
| 4. Global Self-Awareness | |
| 5. Information Literacy | |
| 6. Mathematical and Scientific Reasoning | |

UNITS

Unit 1 Reading and Writing in the Biological Sciences

General Outcome

- 1.0 Clearly communicate in writing information derived from course related readings the major concepts and themes in the environmental sciences.

Specific Learning Outcomes

- 1.1
- 1.2 Demonstrate in writing the ability to analyze, evaluate, compare, and extract data relevant to environmental science from course related readings.
- 1.3 Evaluate the validity of information from a variety of sources, including but not limited to such sources as electronic, print sources, and data bases.
- 1.4 Demonstrate using diagrams, drawings, outlines, concept maps, and/or other methods connections among concepts in environmental science.
- 1.5 Demonstrate the ability to use the appropriate technology to carry out course requirements.

Unit 2 Physical Factors and the EnvironmentGeneral Outcome

- 2.0 Demonstrate an understanding of global geologic, atmospheric, and oceanic trends and evaluate their relationship to the environment.

Specific Learning Outcomes

- 2.1
 2.2 Describe the earth's structure.
 2.3 Examine the characteristics of plate tectonic settings and plate movement.
 2.4 Describe characteristics of the troposphere and stratosphere.
 2.5 Illustrate the Coriolis Effect on global atmospheric belts.
 2.6 Explain the generation and movement of air masses.
 2.7 Compare the patterns of major ocean surface and subsurface currents.

Unit 3 Water in Natural SystemsGeneral Outcome

- 3.0 Describe and diagram the hydrologic cycle, analyze the characteristics of water and assess the finite, recycled nature of the world's water in relationship to Florida's water budget.

Specific Learning Outcomes

- 3.1
 3.2 Assess the importance of water to life.
 3.3 Diagram the hydrologic cycle (closed system) showing the various compartments and processes of the cycle.
 3.4 Demonstrate the flow of water through natural systems in Florida. (Open system)
 3.5 Evaluate the importance of ground water to Florida.
 3.6 Recognize and evaluate the impact of humans upon managing the flow of water through Florida.

Unit 4 EcosystemsGeneral Outcome

- 4.0 Categorize the ecosystems and the food and energy flow within them.

Specific Learning Outcomes

- 4.1
 4.2 Compare and contrast food chains, food webs, and energy flow through ecosystems.
 4.3 Describe and quantify trophic levels in ecosystems.
 4.4 Understand and quantify the concepts underlying population dynamics.
 4.5 Explain predator-prey relationships and the impact of disruptions on these relationships.
 4.6 Compare and contrast the major biomes and aquatic ecosystems of the world.
 4.7 Describe the special features and importance of wetlands ecosystems.
 4.8 Analyze the concept of succession.
 4.9 Calculate residence time of pesticides and other toxins introduced into the environment.
 4.10 Describe and diagram biogeochemical cycles such as carbon, nitrogen, and phosphorus and how they have been impacted by humans.

Unit 5 Geology of Florida

General Outcome

- 5.0 Categorize the various physiographic regions of Florida and explain the underlying geologic processes and their economic importance as non renewable resources.

Specific Learning Outcomes

- 5.1 Describe the formation and characteristics of igneous, sedimentary and metamorphic rocks.
 5.2 Explain the effect of different methods of weathering on rocks.
 5.3 Evaluate the impact of underlying geologic formations on the surface.
 5.4 Explain the origin of minerals such as carbonate and phosphate.
 5.5 Assess the uses of minerals and other nonrenewable resources mined in Florida.
 5.6 Determine the importance of soil to ecosystems and their distribution.

Unit 6 Weather and the EnvironmentGeneral Outcome

- 6.0 Explain the fundamentals of meteorology and relate these fundamentals to the weather trends in Florida.

Specific Learning Outcomes

- 6.1 Analyze the different factors involved in describing weather.
 6.2 Differentiate between the characteristics of different types of weather fronts.
 6.3 Evaluate influences on Florida's weather and major weather trends in Florida.
 6.4 Describe conditions which promote hurricane formation and explain the heat engine dynamics of a hurricane.
 6.5 Interpret the Saffir-Simpson storm classification scheme and give examples of historical storms which have struck Florida.
 6.6 Determine methods of adaptation within native species in response to Florida's weather.
 6.7 Describe the effect of human activities on global warming and solutions that will stabilize the earth's climate.

Unit 7 Ecosystems of FloridaGeneral Outcome

- 7.0 Examine the interaction between the abiotic and biotic factors within different ecosystems of Florida.

Specific Learning Outcomes

- 7.1 Describe the geological and other factors that affect ecosystem distribution in Florida.
 7.2 Examine the characteristics of low energy coastal ecosystems such as mangrove swamps, salt marshes and estuaries and their importance to marine fisheries.
 7.3 Describe the high energy beach ecosystem, including forces that shape coastlines such as longshore drift; explain the importance of vegetation in stabilizing this dynamic ecosystem and how human activities have contributed to beach erosion.
 7.4 Compare and contrast the characteristics of wetland ecosystems such as freshwater marshes, cypress swamps, and southern hardwood swamps.
 7.5 Describe the characteristics of the Everglades and how humans have impacted water distribution, timing, quality and quantity; ~~list~~ Explain the components of CERP and the Kissimmee River Restoration Project.

- 7.6 Compare and contrast the characteristics of upland ecosystems such as slash pine forests, sandhill community, scrub, prairie, and hardwood hammocks.
- 7.7 Analyze the role of fire in shaping Florida ecosystems.
- 7.8 Assess the impact of human activities on Florida ecosystems.

Unit 8 The Ocean

General Outcome

- 8.0 Describe the various physical components of the ocean and the biological interaction with the physical marine environment.

Specific Learning Outcomes

- 8.1 Recognize the various physical zones of the ocean including benthic, littoral and pelagic and the types of organisms found in each.
- 8.2 Compare and contrast the diversity of life on a coral reef.
- 8.3 Explain how the health of coral reefs is influenced by the adjacent coastal and inland ecosystems.
- 8.4 Distinguish among the various types of reefs such as barrier, fringe and patch.
- 8.5 Interpret the impact of pollution, global warming, over-fishing and other human activities on the marine environment and suggest possible solutions.

Unit 9 Energy and the Environment

General Outcome

- 9.0 Describe the law of conservation of matter and the two laws of thermodynamics; compare renewable and nonrenewable energy and compare the advantages and environmental costs of each.

Specific Learning Outcomes

- 9.1 Apply the Law of Conservation of Matter and the First and Second Laws of Thermodynamics to analyze current environmental problems such as pollution and energy conservation.
- 9.2 Distinguish between potential and kinetic energy.
- 9.3 Describe the differences between renewable and nonrenewable sources of energy, and recognize examples of each.
- 9.4 Calculate how long non-renewable fuels will last under a variety of different consumption rates.
- 9.5 Describe environmental consequences caused by exploiting different forms of energy.
- 9.6 Discuss how transition to renewable forms of energy will help reduce the threat of global warming.

Unit 10 Sustainable Solutions

General Outcome

- 10.0 Argue the actions needed to create a sustainable society and analyze ways to apply principles of sustainable thinking to solve environmental problems.

Specific Learning Outcomes

- 10.1
- 10.2 Define sustainable development and recognize the current lifestyle of North Americans is not sustainable.

- 10.3 Analyze the interrelationship between the three components of a sustainable society: ecological integrity, social justice, and economic prosperity.
- 10.4 Demonstrate how the components of sustainable thinking, including basing decisions on what is best in the long term, utilizing interdisciplinary analysis, mirroring nature's solutions, implementing prevention rather than remediation, and systems analysis, may be applied to daily decisions.
- 10.5 Apply the components of sustainable thinking to the analysis of real world problems such as loss of biodiversity, global warming, deforestation and pollution; implement solutions to local problems.
- 10.6 Assess the role of individuals in creating a sustainable society.

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BROWARD COLLEGE COURSE OUTLINE

Last Review: 02/27/2016

Next Review: 08/01/2020

COURSE TITLE: PRINCIPLES OF MACROECONOMICS

COMMON COURSE NUMBER: ECO2013

EFFECTIVE TERM: Fall 2016

CREDIT HOURS: 3

CONTACT HOUR BREAKDOWN

(per 16 week term)

Lecture: 48

Lab:

Clinic:

Other:

College Placement Testing Requirements

Passing Placement Tests score(s) in the following area(s) is/are required:

- English

Prerequisite

None

Corequisite

None

Pre/Corequisite

None

COURSE DESCRIPTION: An introductory course in macroeconomic principles covering basic economic problems and concepts. Topics discussed and analyzed include basic economic problems of unemployment and inflation, as well as fiscal and monetary policies. Students will recognize the role of households, businesses and governments in the market economy and in their own lives. This is a writing credit with International/Intercultural content. Students must earn a minimum grade of C to meet the requirements of the Gordon Rule for writing.

MEETS THE FOLLOWING GENERAL EDUCATION REQUIREMENTS

AA and Baccalaureate Degrees, meets Area(s):

AA/Bac-Area 3b: Social/Behavioral Sciences

AA/Bac-Area 7: Writing Requirement

AA/Bac-Area 8: International/Intercultural

AS Degree, meets Area(s):

AS-Area 3: Social/Behavioral Sciences

AAS Degree, meets Area(s):

AAS-Area 3: Social/Behavioral Sciences

AAS-Area 5: Program-Designated Courses

UNIT TITLES

1. Basic Economic Concepts
2. Measurement of Economic Performance
3. National Income and Price Determination
4. Financial Sector
5. Stabilization Policies
6. International Trade and Finance

EVALUATION:

Students will be evaluated on course material in a number of different ways, including but not limited to: tests, essays, online discussions, in-class discussions, group projects, article analyses, and other methodologies at the discretion of the section instructor.

This is a writing credit course. Course writing assignments require original student academic writing emphasizing formal multi-paragraph compositions, such as exam responses, reading/textual responses, position papers, and documented/researched essays. Course writing assignments require that student writing be on a subject and of a purpose related to the course's learning outcomes and of a length and depth reflecting higher order thinking such as analysis, argument, and evaluation.

| | |
|----------------------------------|---|
| Portfolio | 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0 |
| Short Essay | 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0 |
| Research Project | 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0 |
| Group Projects | 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0 |
| Discussion | 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0 (online), 8.0 |
| Multiple Choice Tests | 1.0, 2.0, 3.0, 4.0, 5.0, 6.0 |
| Presentations | 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 8.0 |
| Service Learning Projects | 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 8.0 |
| Pop Quizzes | 1.0, 2.0, 3.0, 4.0, 5.0, 6.0 |
| Take Home Tests | 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0 |
| Summaries and Critiques | 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 8.0 |
| Reaction Papers | |
| Surveys | 7.0, 8.0 |
| Performance | |
| Short Answer Tests | 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0 |
| Class Room Debates and Colloquia | 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 8.0 |
| Blog, Wikis, Webpages | 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0 |
| Other | |

GENERAL EDUCATION Competencies and Skills:

| | |
|--|------------------------------|
| 1. Critical Thinking | 1.0, 2.0, 3.0, 4.0, 5.0, 6.0 |
| 2. Communicate Effectively | |
| 3. Ethical Reasoning | 1.0, 2.0, 5.0 |
| 4. Global Self-Awareness | 1.0, 2.0, 4.0, 6.0 |
| 5. Information Literacy | |
| 6. Mathematical and Scientific Reasoning | |

UNITS

Unit 1 Basic Economic Concepts

General Outcome

- 1.0 At the end of this course, students will define basic economic concepts and correctly apply economic terminology.

Specific Learning Outcomes

- 1.1
- 1.2 Distinguish between macro and microeconomics.
- 1.3 Explain scarcity, choice and opportunity costs.
- 1.4 Analyze trade-offs through the production possibilities curve and use it to demonstrate economic growth.
- 1.5 Explain the factors of production and technology and their relationship to the structure and performance of an economy.
- 1.6 Distinguish between a change in quantity of supply or demand caused by price and a change in one of the secondary determinants of supply and demand.
- 1.7 Explain the concept of market failure and the government's role in correcting externalities.
- 1.8 Distinguish between normative and positive statements and identify logical fallacies.
- 1.9 Use graphical analysis to demonstrate economic concepts.

Unit 2 Measurement of Economic PerformanceGeneral Outcome

- 2.0 At the end of this course, students will measure and evaluate economic activity using national income accounts, inflation and unemployment, and summarise the causes and effects of economic growth.

Specific Learning Outcomes

- 2.1
- 2.2 Demonstrate and explain the major components of the circular flow model.
- 2.3 Measure GDP and explain its components.
- 2.4 Differentiate between real and nominal GDP using both CPI and the GDP deflator.
- 2.5 Explain inflation demand pull and cost push inflation and their effects.
- 2.6 Evaluate the causes and effects of unemployment, distinguish among the major types of unemployment, measure unemployment and evaluate the measurement techniques.
- 2.7 Demonstrate, explain and analyze the business cycle, including cause and effect.

Unit 3 National Income and Price DeterminationGeneral Outcome

- 3.0 At the end of this course, students will analyze national economic activity through the aggregate demand and supply model.

Specific Learning Outcomes

- 3.1 Explain the determinants of consumer spending and saving and demonstrate these graphically.
- 3.2 Explain the determinants of business investment and demonstrate their understanding using graphical analysis.
- 3.3 Explain and evaluate the importance of savings and investment to economic growth.
- 3.4 Explain the determinants of aggregate supply and demand and demonstrate using graphical analysis.
- 3.5 Calculate and interpret the multiplier and its impact on aggregate demand and GDP.
- 3.6 Evaluate the different views on the shape of the short run, intermediate, and long run AS curve, including sticky wage and price models.

Unit 4 Financial Sector**General Outcome**

- 4.0 At the end of this course, students will evaluate the roles of money, banking and the financial sector in the national economy.

Specific Learning Outcomes

- 4.1 Define the major functions and characteristics of money.
 4.2 Explain what is meant by transaction and asset demand for money and how interest rates are determined using money supply and demand curves.
 4.3 Explain the origins and functioning of the fractional reserve banking system in the US and how the system creates money, including the monetary multiplier.
 4.4 Explain and calculate nominal and real interest rates.
 4.5 Use graphical analysis to explain the loanable funds market.

Unit 5 Stabilization Policies**General Outcome**

- 5.0 At the end of the course, students will evaluate and apply fiscal and monetary policies to economic situations.

Specific Learning Outcomes

- 5.1 Explain and differentiate the tools of monetary and fiscal policies, correctly identifying the appropriate policies for use in inflation and recession.
 5.2 Evaluate and compare the efficacy of fiscal and monetary policies, identifying and explaining lags and other factors such as the crowding out effect.
 5.3 Evaluate the impact of government deficits and debt.
 5.4 Compare and contrast the expected outcome of stabilization policies from the perspective of alternative theories.
 5.5 Demonstrate the effects of fiscal and monetary policy using the AD/AS model.
 5.6 Demonstrate the effects of monetary policy on the money supply and demand curve.

Unit 6 International Trade and Finance**General Outcome**

- 6.0 At the end of the course, students will describe the theories and problems of international trade, balance of payments and exchange rates.

Specific Learning Outcomes

- 6.1
 6.2 Explain the theories of absolute and comparative advantage.
 6.3 Identify and evaluate the use of trade barriers and free trade arrangements.
 6.4 Explain the major elements of the balance of payments and evaluate the trade deficit, and explain the relationship between the current and capital and financial accounts.
 6.5 Explain and evaluate the Bretton Woods and post Bretton Woods exchange rate systems, as well as flexible versus fixed exchange rates.
 6.6 Interpret an exchange rate graph to explain currency appreciation and depreciation.

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BROWARD COLLEGE COURSE OUTLINE

Last Review: 02/25/2016

Next Review: 08/01/2020

COURSE TITLE: COMPOSITION I**COMMON COURSE NUMBER:** ENC1101**EFFECTIVE TERM:** Fall 2016**CREDIT HOURS:** 3**CONTACT HOUR BREAKDOWN**

(per 16 week term)

Lecture: 48

Lab:

Clinic:

Other:

College Placement Testing Requirements

Passing Placement Tests score(s) in the following area(s) is/are required:

- English
- Reading

Prerequisite

None

Corequisite

None

Pre/Corequisite

None

COURSE DESCRIPTION: ENC 1101 is a university parallel course that requires students to learn and practice writing by creating original compositions, exploring basic rhetorical forms such as narration, exposition, and argumentation. Students also will develop research skills and learn to incorporate researched material through the writing process. For non-exempt students, placement in ENC 1101 is determined by both standard and departmental assessment tests. Students must earn a grade of C or higher to meet the requirements of the Gordon Rule. This is a writing credit course that focuses on extensive writing and revision.

MEETS THE FOLLOWING GENERAL EDUCATION REQUIREMENTS

AA and Baccalaureate Degrees, meets Area(s):

AA/Bac-Area 1a: Composition

AA/Bac-Area 7: Writing Requirement

AS Degree, meets Area(s):

AS-Area 1: Communications

AAS Degree, meets Area(s):

AAS-Area 1: Communications

AAS-Area 5: Program-Designated Courses

UNIT TITLES

1. Conventions of Standard American English
2. The Academic Essay
3. Critical Analysis and Revising
4. Research Skills

EVALUATION:

This is a writing credit course. Course writing assignments require original student academic writing that emphasizes formal multi-paragraph compositions, such as exam responses, reading/textual responses, position papers, and documented/researched essays. Course writing assignments require that student writing be on a subject and of a purpose related to the course's learning outcomes and of a length and depth reflecting higher order thinking such as analysis, argument, and evaluation.

| | | |
|----------------------------------|--|--|
| Portfolio | | |
| Short Essay | | |
| Research Project | | |
| Group Projects | | |
| Discussion | | |
| Multiple Choice Tests | | |
| Presentations | | |
| Service Learning Projects | | |
| Pop Quizzes | | |
| Take Home Tests | | |
| Summaries and Critiques | | |
| Reaction Papers | | |
| Surveys | | |
| Performance | | |
| Short Answer Tests | | |
| Class Room Debates and Colloquia | | |
| Blog, Wikis, Webpages | | |
| Other | | |

GENERAL EDUCATION Competencies and Skills:

| | |
|--|--------------------|
| 1. Critical Thinking | 2.0, 3.0, 4.0 |
| 2. Communicate Effectively | 1.0, 2.0, 3.0, 4.0 |
| 3. Ethical Reasoning | 4.0 |
| 4. Global Self-Awareness | |
| 5. Information Literacy | 2.0, 3.0, 4.0 |
| 6. Mathematical and Scientific Reasoning | |

UNITS

Unit 1 Conventions of Standard American English

General Outcome

1.0 Identify, construct, and use grammatical conventions of Standard Written American English.

Specific Learning Outcomes

- 1.1 Learn to avoid common subject and verb errors.
- 1.2 Learn to avoid common noun and pronoun errors.
- 1.3 Learn to avoid common sentence errors.
- 1.4 Learn to improve language usage and style.
- 1.5 Learn to avoid common determiner, modifier, and preposition errors.
- 1.6 Learn to avoid common errors in punctuation, mechanics, and spelling.

Unit 2 The Academic Essay

General Outcome

- 2.0 Compose essays that provide ideas and information suitable to the audience and purpose of writing.

Specific Learning Outcomes

- 2.1 Formulate an effective thesis statement that responds to the purpose of a writing assignment.
- 2.2 Develop essays with effective introductions, body paragraphs, and conclusions, recognizing their importance to the foundation of a clear and coherent academic essay.
- 2.3 Demonstrate time-management, self-direction, and self-motivation when writing and revising an academic essay.
- 2.4 Write grammatically correct prose, following the punctuation and mechanics for Standard Written American English.

Unit 3 Critical Analysis and RevisingGeneral Outcome

- 3.0 Students will critically analyze course readings and revise other student writing with a view to their content, tone, grammar, logic, thesis statement, and thoroughness of citations (if any). The student will be able to identify the main idea or thesis of the text; recognize and evaluate the supporting details; and comment on the effectiveness of the writer's overall technique.

Specific Learning Outcomes

- 3.1 Effectively comment on the content and purpose of a professionally published essay and analyze its effectiveness in writing or classroom discussion.
- 3.2 Recognize the relationship between clear sentence structure, punctuation, mechanics, and meaning in assigned readings and student writing.
- 3.3 Analyze peer writing critically, creatively, and reflectively. Students will be able to offer their own ideas on effective revision of an essay and communicate strengths and weaknesses of that essay, paying particular attention to grammar, thesis clarity, logical development, and effectiveness of prose.

Unit 4 Research SkillsGeneral Outcome

- 4.0 Locate, evaluate, and incorporate research material in print and/or electronic format for use in a research essay.

Specific Learning Outcomes

- 4.1 Determine a subject's suitability for library research.
- 4.2 Use appropriate research resources.
- 4.3 Evaluate critical sources for their validity, accuracy, and value in an academic paper.
- 4.4 Apply critical thinking and problem solving skills to research and synthesize source material.
- 4.5 Extract relevant information from source material.
- 4.6 Demonstrate professional and ethical writing by incorporating researched information within a text and by following the citation, bibliographic, and paper formatting which follows current MLA guidelines. MLA is the preferred style guide for English.
- 4.7 Demonstrate skills incorporating quotations, in-text citations, and bibliographic documentation.

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BROWARD COLLEGE COURSE OUTLINE

Last Review: 08/01/2009

Next Review: 08/01/2014

COURSE TITLE: DATABASE DESIGN AND PROGRAMMING USING SQL

COMMON COURSE NUMBER: COP2071C

EFFECTIVE TERM:

CREDIT HOURS: 3

CONTACT HOUR BREAKDOWN

(per 16 week term)

Lecture: 48

Lab: 16

Clinic: 0

Other: 0

College Placement Testing Requirements

N/A

Prerequisite

None

Corequisite

None

Pre/Corequisite

None

COURSE DESCRIPTION: This course provides the student with a solid foundation in Relational Database Management Systems and RDBMS technology. It emphasizes an "end-to-end solution, beginning with requirements and progressing through conceptual design, logical database design, physical database design, and implementation, using a RDBMS and the SQL language. It involves extensive database manipulation and querying using SQL. It also "stresses transaction management concepts, data integrity constraints, and performance issues.

UNIT TITLES

1. The Database Environment
2. The Database Development Process
3. Modeling Data in the Organization
4. The Enhanced E-R Model and Business Rules
5. Logical Database Design and the Relational Model
6. Physical Database Design and Performance
7. Introduction to SQL
8. Advanced SQL
9. Unit 9
10. Unit 10

EVALUATION:

Evaluation instruments will include written and/or skills-based examinations and individual projects and labs. Evaluation methods may also include group in-class labs and/or take-home assignments.

UNITS**Unit 1 The Database Environment****General Outcome**

- 1.0 The students should be able to understand the database environment and compare database technology and conventional file-processing systems.

Specific Learning Outcomes

- 1.1 Explain why databases will continue to grow in number and importance.
- 1.2 Name several limitations of conventional file-processing systems.
- 1.3 Identify five categories of database systems.
- 1.4 Explain the advantages of using a database approach over using a traditional file-processing approach.
- 1.5 Identify several cost and risks of the database approach.
- 1.6 Describe the components of a typical database environment.
- 1.7 Describe the evolution of database systems.

Unit 2 The Database Development ProcessGeneral Outcome

- 2.0 The students should be able to explain the process of database development for both structured life cycle and prototyping methodologies.

Specific Learning Outcomes

- 2.1 Describe the life cycle of a systems development project.
- 2.2 Explain the prototyping approach to database and application development.
- 2.3 Explain the roles of individuals who design, implement, use, and administer databases.
- 2.4 Explain the differences between external, conceptual, and internal schemas and the reasons for a three-schema architecture for databases.
- 2.5 Explain the role of packaged data models in database development.
- 2.6 Explain the three-tiered location architecture for databases and database processing.
- 2.7 Explain the scope of a database design and development class project.
- 2.8 Draw simple data models that show the scope of a database.

Unit 3 Modeling Data in the OrganizationGeneral Outcome

- 3.0 The students should be able to understand conceptual data modeling with the entity-relationship (E-R) model.

Specific Learning Outcomes

- 3.1 State the reasons why data modeling is an important part of the system development approach.
- 3.2 Write good names and definitions for entities, relationships, and attributes.
- 3.3 Distinguish unary, binary, and ternary relationships and give an example of each.
- 3.4 Model each of the following constructs in an E-R diagram: composite attribute, multivalued attribute, derived attribute, associative entity, identifying relationships, and minimum and maximum cardinality constraints.
- 3.5 Draw an E-R diagram to represent common business situations.
- 3.6 Convert a many-to-many relationship to an associative entity type.
- 3.7 Model simple time-dependent data using time stamps and relationships in an E-R diagram.

Unit 4 The Enhanced E-R Model and Business RulesGeneral Outcome

- 4.0 The students should be able understand advanced E-R data model constructs.

Specific Learning Outcomes

- 4.1 Understand when to use subtype/supertype relationships in data modeling.
- 4.2 Use both specialization and generalization techniques for defining supertype/subtype relationships.
- 4.3 Specify both completeness constraints and disjointness constraints in modeling subtype/supertype relationships.
- 4.4 Develop a supertype/subtype hierarchy for a realistic business situation.
- 4.5 Develop an entity cluster to simplify presentation of an E-R diagram.
- 4.6 Explain the major features and data modeling structures of a universal data model.
- 4.7 Name the various categories of business rules.
- 4.8 Define a simple operational constraint using a graphical model or structured English treatment.

Unit 5 Logical Database Design and the Relational Model**General Outcome**

- 5.0 The students should be able to convert a conceptual data model to a relational model.

Specific Learning Outcomes

- 5.1 List properties of relations.
- 5.2 State properties that is essential for a candidate key.
- 5.3 Give a concise definition of each of the following: the first normal, the second normal form, and the third normal form.
- 5.4 Briefly describe some problems that may arise when merging relations.
- 5.5 Transform an E-R diagram to a logically equivalent set of relations.
- 5.6 Create relational tables that incorporate entity integrity and referential integrity constraints.
- 5.7 Use normalization to decompose a relation with anomalies into well-structured relations.

Unit 6 Physical Database Design and Performance**General Outcome**

- 6.0 The students should be able to optimize database performance.

Specific Learning Outcomes

- 6.1 Describe the physical database design process, its objectives, and deliverables.
- 6.2 Choose storage formats for attributes from a logical data model.
- 6.3 Select an appropriate file organization by balancing various important design factors.
- 6.4 Describe three important types of file organization.
- 6.5 Describe the purpose of indexes and the considerations in selecting attributes to be indexed.
- 6.6 Translate a relational data model into efficient database structures, including knowing when and how to denormalize the logical data model.

Unit 7 Introduction to SQL**General Outcome**

- 7.0 The students should be able to use some basic SQL commands.

Specific Learning Outcomes

- 7.1 Interpret the history and role of SQL in database development.
- 7.2 Define a database using the SQL data definition language.
- 7.3 Write single table queries using SQL commands.
- 7.4 Establish referential integrity using SQL.

Unit 8 **Advanced SQL**

General Outcome

- 8.0 The students should be able to use advanced SQL commands.

Specific Learning Outcomes

- 8.1 Write single and multiple table queries using SQL commands.
- 8.2 Define three types of join commands and use SQL to write these commands.
- 8.3 Write noncorrelated and correlated subqueries and know when to write each.
- 8.4 Understand common uses of database triggers and stored procedures.

Unit 9 **Unit 9**

General Outcome

- 9.0 The students should be able to use templates in program design and development.

Specific Learning Outcomes

- 9.1 Discuss and use function templates
- 9.2 Overload function templates
- 9.3 Discuss and use class templates
- 9.4 Explain class templates and non-type parameters
- 9.5 Discuss the relationship between templates and inheritance
- 9.6 Discuss the use of friends with templates
- 9.7 Explain and use static data members with templates

Unit 10 **Unit 10**

General Outcome

- 10.0 The students should be able to incorporate C++'s exception handling features into their programs.

Specific Learning Outcomes

- 10.1 Discuss the concept of exception handling
- 10.2 Explain when exception handling should be used
- 10.3 Describe and use try and catch blocks
- 10.4 Throw an exception
- 10.5 Catch an exception
- 10.6 Rethrow an exception
- 10.7 Throw a conditional expression
- 10.8 Discuss constructors, destructors and exception handling
- 10.9 Explain the relationship between exceptions and inheritance.

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BROWARD COLLEGE COURSE OUTLINE

Last Review:

Next Review:

COURSE TITLE: DATABASE MANAGEMENT

COMMON COURSE NUMBER: CGS1540CU

EFFECTIVE TERM:

CREDIT HOURS: 3

CONTACT HOUR BREAKDOWN

(per 16 week term)

Lecture: 48

Lab: 0

Clinic: 0

Other: 0

College Placement Testing Requirements

N/A

Prerequisite

None

Corequisite

None

Pre/Corequisite

None

COURSE DESCRIPTION: This course is an introduction to database "management. Using appropriate database software," students will learn to maintain and manipulate "data in an organized, accessible and accurate" manner. Emphasis is placed on the use of microcomputer database management software for common business applications.

UNIT TITLES

1. Introduction to DOS
2. Structuring a Database
3. Entering and Using Data
4. Creating Labels and Reports
5. Using the Relational System
6. Transferring Files Between Applications
7. Introduction to Programming

EVALUATION:**UNITS****Unit 1 Introduction to DOS**General Outcome

- 1.0 The students should be able to apply DOS to support the use of database management.

Specific Learning Outcomes

- 1.1 Boot DOS.
- 1.2 Format a diskette.
- 1.3 Copy a diskette.
- 1.4 Copy files.
- 1.5 Display directories.

- 1.6 Change active drives.
- 1.7 Apply wildcard symbols.
- 1.8 Identify the proper care and maintenance of a diskette.

Unit 2 Structuring a Database**General Outcome**

- 2.0 The students should be able to use a set of computer programs that provide a means for storing, updating, and retrieving information.

Specific Learning Outcomes

- 2.1 Define the terminology used with database systems.
- 2.2 Create a database file.
- 2.3 Specify fields to be included in a file.
- 2.4 Enter information into a database file.
- 2.5 Browse a database file.
- 2.6 Sum and average numeric fields in a database.
- 2.7 Switch from one database file to another.
- 2.8 Print a screen display.
- 2.9 Modify an existing database structure.

Unit 3 Entering and Using Data**General Outcome**

- 3.0 The students should be able to manipulate the data in a database file.

Specific Learning Outcomes

- 3.1 Display selected records in a database.
- 3.2 Describe the concept of a record pointer.
- 3.3 Manipulate a record pointer in a database.
- 3.4 Sort records in a database.
- 3.5 Index records in a database.
- 3.6 Delete, restore, and pack records in an existing database.
- 3.7 Add records to an existing database.
- 3.8 Edit existing records in a database.

Unit 4 Creating Labels and Reports**General Outcome**

- 4.0 The students should be able to use comparison operators, connectors and use a query with reports within the relational system. In addition, the students should be able to develop labels, save a report definition, generate a report, turn off a query and recall a report.

Specific Learning Outcomes

- 4.1 Define a query.
- 4.2 Use comparison operators relating to the system.
- 4.3 Establish a query for reports.
- 4.4 Save a query.
- 4.5 Specify a sort in a report.

- 4.6 Generate reports.
- 4.7 Manipulate date fields.
- 4.8 Develop labels.
- 4.9 Save a report definition.
- 4.10 Turn off a query.
- 4.11 Recall a report.

Unit 5 Using the Relational System

General Outcome

- 5.0 The students should be able to use comparison operators, connectors, and use a query from reports with the relational databases.

Specific Learning Outcomes

- 5.1 Simultaneously use multiple database files.
- 5.2 Perform join operations on multiple database files.
- 5.3 Setup relations between database files.
- 5.4 Generate and use custom screen formats for data entry.
- 5.5 Create a command (program) file.

Unit 6 Transferring Files Between Applications

General Outcome

- 6.0 The students should be able to transfer information (files) between applications.

Specific Learning Outcomes

- 6.1 Transfer information between the word processor, spreadsheet, and database management applications.
- 6.2 Describe the function of the DOS text (ASCII) file.

Unit 7 Introduction to Programming

General Outcome

- 7.0 The students should be able to develop simple database programs.

Specific Learning Outcomes

- 7.1 Create a COMMAND FILE.
- 7.2 Modify a COMMAND FILE.
- 7.3 Write a simple program to provide a MENU.

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BROWARD COLLEGE COURSE OUTLINE

Last Review: 03/09/2016

Next Review: 08/01/2020

COURSE TITLE: Installing and Configuring Windows Server 2012**COMMON COURSE NUMBER:** CTS1390C**EFFECTIVE TERM:** Fall 2016**CREDIT HOURS:** 3**CONTACT HOUR BREAKDOWN**

(per 16 week term)

Lecture: 32

Lab: 16

Clinic:

Other:

College Placement Testing Requirements

N/A

PrerequisiteCTS2131C with a minimum grade of C
and**Corequisite**

None

Pre/Corequisite

None

COURSE DESCRIPTION: This course will give students the initial skills to implement and configure Windows Server 2012 core services, such as Active Directory and the networking services.**UNIT TITLES**

1. Install and Configure Servers
2. Configure Server Roles and Features
3. Configure Hyper-V
4. Deploy and Configure Core Network Services
5. Install and Administer Active Directory
6. Create and Manage Group Policy

EVALUATION:

Evaluation instruments will include written and/or skills-based examination and individual in-class and/or take-home assignments. Evaluation methods may also include group in-class and/or take-home assignments.

UNITS**Unit 1 Install and Configure Servers**General Outcome

- 1.0 Students will be able to install and configure servers.

Specific Learning Outcomes

- 1.1 • Install servers
- This objective may include but is not limited to: Plan for a server installation; plan for server roles; plan for a server upgrade; install Server Core; optimize resource utilization by using Features on Demand; migrate roles from previous versions of Windows Server

- 1.2 • Configure servers
 - This objective may include but is not limited to: Configure Server Core; delegate administration; add and remove features in offline images; deploy roles on remote servers; convert Server Core to/from full GUI; configure services; configure NIC teaming
- 1.3 • Configure local storage
 - This objective may include but is not limited to: Design storage spaces; configure basic and dynamic disks; configure MBR and GPT disks; manage volumes; create and mount virtual hard disks (VHDs); configure storage pools and disk pools

Unit 2 Configure Server Roles and Features

General Outcome

2.0 Student will be able to configure server roles and features.

Specific Learning Outcomes

- 2.1 • Configure file and share access
 - This objective may include but is not limited to: Create and configure shares; configure share permissions; configure offline files; configure NTFS permissions; configure access-based enumeration (ABE); configure Volume Shadow Copy Service (VSS); configure NTFS quotas
- 2.2 • Configure print and document services
 - This objective may include but is not limited to: Configure the Easy Print print driver; configure Enterprise Print Management; configure drivers; configure printer pooling; configure print priorities; configure printer permissions
- 2.3 • Configure servers for remote management
 - This objective may include but is not limited to: Configure WinRM; configure down-level server management; configure servers for day-to-day management tasks; configure multi-server management; configure Server Core; configure Windows Firewall

Unit 3 Configure Hyper-V

General Outcome

3.0 Student will be able to configure virtual machines and networks.

Specific Learning Outcomes

- 3.1 • Create and configure virtual machine settings
 - This objective may include but is not limited to: Configure dynamic memory; configure smart paging; configure Resource Metering; configure guest integration services
- 3.2 • Create and configure virtual machine storage
 - This objective may include but is not limited to: Create VHDs and VHDX; configure differencing drives; modify VHDs; configure pass-through disks; manage snapshots; implement a virtual Fibre Channel adapter
- 3.3 • Create and configure virtual networks
 - This objective may include but is not limited to: Implement Hyper-V Network Virtualization; configure Hyper-V virtual switches; optimize network performance; configure MAC addresses; configure network isolation; configure synthetic and legacy virtual network adapters

Unit 4 Deploy and Configure Core Network Services

General Outcome

4.0 Students will be able to deploy and configure core network services.

Specific Learning Outcomes

- 4.1 • Configure IPv4 and IPv6 addressing
 • This objective may include but is not limited to: Configure IP address options; configure subnetting; configure supernetting; configure interoperability between IPv4 and IPv6; configure ISATAP; configure Teredo
- 4.2 • Deploy and configure Dynamic Host Configuration Protocol (DHCP) service
 • This objective may include but is not limited to: Create and configure scopes; configure a DHCP reservation; configure DHCP options; configure client and server for PXE boot; configure DHCP relay agent; authorize DHCP server
- 4.3 • Deploy and configure DNS service
 • This objective may include but is not limited to: Configure Active Directory integration of primary zones; configure forwarders; configure Root Hints; manage DNS cache; create A and PTR resource records

Unit 5 Install and Administer Active Directory

General Outcome

5.0 Students will be able to install and administer Active Directory.

Specific Learning Outcomes

- 5.1 • Install domain controllers
 • This objective may include but is not limited to: Add or remove a domain controller from a domain; upgrade a domain controller; install Active Directory Domain Services (AD DS) on a Server Core installation; install a domain controller from Install from Media (IFM); resolve DNS SRV record registration issues; configure a global catalog server
- 5.2 • Create and manage Active Directory users and computers
 • This objective may include but is not limited to: Automate the creation of Active Directory accounts; create, copy, configure, and delete users and computers; configure templates; perform bulk Active Directory operations; configure user rights; offline domain join; manage inactive and disabled accounts
- 5.3 • Create and manage Active Directory groups and organizational units (OUs)
 • This objective may include but is not limited to: Configure group nesting; convert groups including security, distribution, universal, domain local, and domain global; manage group membership using Group Policy; enumerate group membership; delegate the creation and management of Active Directory objects; manage default Active Directory containers; create, copy, configure, and delete groups and OUs

Unit 6 Create and Manage Group Policy

General Outcome

6.0 Students will be able to create and manage group policies.

Specific Learning Outcomes

- 6.1 • Create Group Policy objects (GPOs)
 • This objective may include but is not limited to: Configure a Central Store; manage starter GPOs; configure GPO links; configure multiple local group policies; configure security filtering

- 6.2 • Configure security policies
 - This objective may include but is not limited to: Configure User Rights Assignment; configure Security Options settings; configure Security templates; configure Audit Policy; configure Local Users and Groups; configure User Account Control (UAC)
- 6.3 • Configure application restriction policies
 - This objective may include but is not limited to: Configure rule enforcement; configure Applocker rules; configure Software Restriction Policies
- 6.4 • Configure Windows Firewall
 - This objective may include but is not limited to: Configure rules for multiple profiles using Group Policy; configure connection security rules; configure Windows Firewall to allow or deny applications, scopes, ports, and users; configure authenticated firewall exceptions; import and export settings

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BROWARD COLLEGE COURSE OUTLINE

Last Review: 03/13/2015

Next Review: 08/01/2014

COURSE TITLE: INTERNET SITE DESIGN

COMMON COURSE NUMBER: CGS1557C

EFFECTIVE TERM:

CREDIT HOURS: 3

CONTACT HOUR BREAKDOWN

(per 16 week term)

Lecture: 40

Lab: 8

Clinic:

Other:

College Placement Testing Requirements

N/A

Prerequisite

CGS1060C with a minimum grade of C

Corequisite

None

Pre/Corequisite

None

COURSE DESCRIPTION: This course is an entry-level course that provides students with baseline technical knowledge and skills of Internet, intranet, and extranet technologies. Other topics include validating your HTML and CSS code, employing search engine optimization (SEO), using style sheets to format Web page content, and implementing fundamental design concepts. Students will gain a basic knowledge and/or competency of Internet skills and tasks in 2 core content areas: Internet Business Foundations and Site Development Foundations.

UNIT TITLES

1. IT Job Roles
2. Internet Services and Web Browsers
3. Internet Protocols and Security
4. Web Site Development
5. Designing and Testing Web Sites

EVALUATION:

Evaluation instruments will include written and/or skills-based examinations and individual in-class and/or take-home assignments. Evaluation methods may also include group in-class and/or take-home assignments.

UNITS**Unit 1 IT Job Roles**General Outcome

- 1.0 The student shall understand the fundamental elements of project management and the importance of acquiring these skills for all IT job roles.

Specific Learning Outcomes

- 1.1 Identify job roles in the Information Technology (IT) industry, including the responsibilities, tasks and skills they require.
- 1.2 Demonstrate ways to communicate effectively using Internet technology.

- 1.3 **Relate project management concepts and terms to the IT profession.**
- 1.4 **Manage career opportunities in the IT industry.**
- 1.5 **Represent technical issues to a nontechnical audience.**

Unit 2 Internet Services and Web Browsers

General Outcome

- 2.0 **The student shall identify and understand the basic functions of Web browsers, the components of Web Addresses, the use and control of cookies, how plug-ins can improve Web browsing, databases (as they relate to Web search engines), email client configuration, instant messaging and newsgroup use.**

Specific Learning Outcomes

- 2.1 **Identify the functions of Web browsers, and use them to access the World Wide Web and other computer resources.**
- 2.2 **Use e-mail clients to send simple messages and files to other Internet users.**
- 2.3 **Define and use additional networking and Internet services.**
- 2.4 **Identify and configure user customization features in Web browsers, including preferences, caching, cookies.**
- 2.5 **Use different types of Web search engines effectively.**
- 2.6 **Identify and use principles of Personal Information Management (PIM), including common applications.**
- 2.7 **Recognize essential database concepts.**
- 2.8 **Conduct a Webcast and related services.**
- 2.9 **Define essential social networking and Web 2.0 concepts.**

Unit 3 Internet Protocols and Security

General Outcome

- 3.0 **The student shall identify and understand Internet connection methods and protocols, the Domain Name System (DNS), the risks associated with being connected to the Internet and security measures that can keep their system and their personal information secure.**

Specific Learning Outcomes

- 3.1 **Identify the infrastructure required to access the Internet, including hardware and software components.**
- 3.2 **Define important Internet communications protocols and their roles in delivering basic Internet services.**
- 3.3 **Identify the basic principles of the Domain Name System (DNS).**
- 3.4 **Identify security issues related to Internet clients (e.g., Web browsers, email, instant messaging) in the workplace, including certificates, malware, illicit servers, viruses.**
- 3.5 **Efficiently transmit text and binary files using popular Internet services.**
- 3.6 **Identify security-related ethical and legal issues faced by IT professionals.**
- 3.7 **Distinguish between proprietary and open-source development models.**

Unit 4 Web Site Development

General Outcome

- 4.0 **The student shall develop Web sites using Hypertext Markup Language (HTML) by writing code manually, as well as through graphical user interface (GUI) authoring tools and use CGI to connect Web pages to databases.**

Specific Learning Outcomes

- 4.1 **Demonstrate knowledge required to create a Web page.**
- 4.2 **Add images and graphical formatting to HTML files, and create and edit images and audio.**
- 4.3 **Identify and use design and color principles for Web pages.**
- 4.4 **Create a basic HTML form that accepts user input.**
- 4.5 **Define Extensible Markup Language (XML), and identify its features and appropriate use.**
- 4.6 **Identify essential Web site navigation issues, and ensure page/site accessibility.**
- 4.7 **Define and apply essential aspects of the Cascading Style Sheets (CSS) standard, including CSS versions 1, 2 and 3.**
- 4.8 **Use the most current version of Hypertext Markup Language (HTML5) to create Web pages.**
- 4.9 **Identify technologies for enhancing the user's Web experience, including programming languages, multimedia technologies.**
- 4.10 **Use GUI-based HTML editing software to create Web pages.**

Unit 5 Designing and Testing Web Sites

General Outcome

- 5.0 **The student shall learn to validate HTML code, recognize the importance of marketing, implement fundamental design concepts, identify ecommerce solutions and relate Web site development to business goals as a productive part of a Web site development team.**

Specific Learning Outcomes

- 5.1 **Test and analyze Web site performance issues.**
- 5.2 **Identify steps in the Web site planning and development process.**
- 5.3 **Identify essential issues in developing and maintaining a Web site, including project management, testing, legal issues.**
- 5.4 **Plan and deliver oral presentations of your Web site, during and after site development.**
- 5.5 **Define electronic commerce (ecommerce) and related technologies and concepts necessary to develop a secure, useful interface (i.e., storefront).**
- 5.6 **Demonstrate knowledge of languages commonly used to provide database connectivity to Web sites.**
- 5.7 **Identify the benefits and drawbacks of running your own Web server versus using a service provider.**
- 5.8 **Identify common strategies for managing an end user's experience and improving site creativity.**
- 5.9 **Consider copyright and ethical issues when creating Web pages.**
- 5.10 **Design Web pages to industry standards.**

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BROWARD COLLEGE COURSE OUTLINE

Last Review:**Next Review:****COURSE TITLE:** INTRODUCTION TO C++**COMMON COURSE NUMBER:** COP1334CU**EFFECTIVE TERM:****CREDIT HOURS:** 3**CONTACT HOUR BREAKDOWN**

(per 16 week term)

Lecture: 48

Lab: 16

Clinic: 0

Other: 0

College Placement Testing Requirements

N/A

Prerequisite

None

Corequisite

None

Pre/Corequisite

None

COURSE DESCRIPTION: This course provides an introduction to computer program design and development using the C++ "language. A structured, multi-phase, program" development process featuring a series of steps "involving problem definition, top-down design, and" formal program specification is stressed. The course is intended to provide the novice programming student with the techniques needed to "develop well-documented, structured computer" programs. Students who do not possess computer programming experience are strongly encouraged to complete COP1000C (Introduction to Computer Programming) before attempting this course.

UNIT TITLES**EVALUATION:****UNITS**

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BROWARD COLLEGE COURSE OUTLINE

Last Review: 03/09/2016

Next Review: 08/01/2020

COURSE TITLE: LINUX +

COMMON COURSE NUMBER: CTS111C

EFFECTIVE TERM: Fall 2016

CREDIT HOURS: 3

CONTACT HOUR BREAKDOWN

(per 16 week term)

Lecture: 32

Lab: 16

Clinic:

Other:

College Placement Testing Requirements

N/A

Prerequisite

None

Corequisite

None

Pre/Corequisite

None

COURSE DESCRIPTION: This course provides students with the knowledge and skills necessary to effectively administer Linux workstations and servers. Students will plan, install, maintain, and troubleshoot Linux operating system services. The skills developed by students completing this course will help prepare them for the CompTIA Linux+ certification exam.

UNIT TITLES

1. System Architecture
2. Linux Installation and Package Management
3. GNU and Unix Commands
4. Devices, Linux Filesystems, Filesystem Hierachy Standard
5. Shells, Scripting and Data Management
6. User Interfaces and Desktops
7. Administrative Tasks
8. Essential System Services
9. Networking Fundamentals
10. Security

EVALUATION:

Evaluation instruments will include written and/or skills-based examination and individual in-class and/or take-home assignments. Evaluation methods may also include group in-class and/or take-home assignments.

UNITS**Unit 1 System Architecture**General Outcome

- 1.0 Students will have a working knowledge of the System Architecture.

Specific Learning Outcomes

- 1.1 Determine and Configure hardware setting
- 1.2 Boot the System
- 1.3 Change runlevels and shutdown or reboot system

Unit 2 Linux Installation and Package Management

General Outcome

- 2.0 Students will be able to install the OS and software packages.

Specific Learning Outcomes

- 2.1 Design hard disk layout
- 2.2 Install a boot manager
- 2.3 Manage shared libraries
- 2.4 Use Debian package management
- 2.5 Use RPM and YUM package management

Unit 3 GNU and Unix Commands

General Outcome

- 3.0 Students will be able to use the command line.

Specific Learning Outcomes

- 3.1 Work on the command line
- 3.2 Process text streams using filters
- 3.3 Perform basic file management
- 3.4 Use streams, pipes and redirects
- 3.5 Create, monitor and kill processes
- 3.6 Modify process execution priorities
- 3.7 Search text files using regular expressions
- 3.8 Perform basic file editing operations using vi

Unit 4 Devices, Linux Filesystems, Filesystem Hierachy Standard

General Outcome

- 4.0 Students will understand the Filesystem Hierarchy Standard and be able to make changes to the file system.

Specific Learning Outcomes

- 4.1 Create partitions and filesystems
- 4.2 Maintain the integrity of filesystems
- 4.3 Control mounting and unmounting of filesystems
- 4.4 Manage disk quotas
- 4.5 Manage file permissions and ownership
- 4.6 Create and change hard and symbolic links
- 4.7 Find system files and place files in the correct location

Unit 5 Shells, Scripting and Data Management

General Outcome

- 5.0 Students will be able create scripts and manipulate data using SQL.

Specific Learning Outcomes

- 5.1 Customize and use the shell environment
- 5.2 Customize or write simple scripts
- 5.3 SQL data management

Unit 6 User Interfaces and Desktops**General Outcome**

- 6.0 Students will be able to configure X11, desktop managers, and accessibility features.

Specific Learning Outcomes

- 6.1 **Install and configure X11**
- 6.2 **Setup a display manager**
- 6.3 **Accessibility**

Unit 7 Administrative Tasks**General Outcome**

- 7.0 Students will be able to perform routine administrative tasks.

Specific Learning Outcomes

- 7.1 **Manage user and group accounts and related system files**
- 7.2 **Automate system administration tasks by scheduling jobs**
- 7.3 **Localisation and internationalisation**

Unit 8 Essential System Services**General Outcome**

- 8.0 Students will be able to maintain essential system services.

Specific Learning Outcomes

- 8.1 **Maintain system time**
- 8.2 **System logging**
- 8.3 **Mail Transfer Agent (MTA) basics**
- 8.4 **Manage printers and printing**

Unit 9 Networking Fundamentals**General Outcome**

- 9.0 Students will be able to understand and configure the network settings.

Specific Learning Outcomes

- 9.1 **Fundamentals of internet protocols**
- 9.2 **Basic network configuration**
- 9.3 **Basic network troubleshooting**
- 9.4 **Configure client side DNS**

Unit 10 Security**General Outcome**

10.0 Students will be able to perform basic security administrative tasks.

Specific Learning Outcomes

- 10.1 **Perform security administration tasks**
- 10.2 **Setup host security**
- 10.3 **Securing data with encryption**

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BROWARD COLLEGE COURSE OUTLINE

Last Review: 03/12/2015

Next Review: 08/01/2019

COURSE TITLE: MANAGING A SERVER NETWORK OPERATING SYSTEM**COMMON COURSE NUMBER:** CTS2383C**EFFECTIVE TERM:** Fall 2015**CREDIT HOURS:** 3**CONTACT HOUR BREAKDOWN**

(per 16 week term)

Lecture: 32

Lab: 32

Clinic:

Other:

College Placement Testing Requirements

N/A

Prerequisite

CET2742C with a minimum grade of C

or

CTS1134C with a minimum grade of C

Corequisite

None

Pre/Corequisite

None

COURSE DESCRIPTION: This course provides students with the knowledge and skills necessary to install and configure a network server and perform post-installation and day-to-day administrative tasks. The course gives the student the background needed to provide technical support for network servers. This course is taught using a networking operating dictated by industry conditions. When taught using the Windows 2008 platform this course will assist the student in preparing for the related Microsoft certification examination.

UNIT TITLES

1. Install and Setup A Server Operating System
2. Install Services
3. Install and Configure Virtualization
4. Deploy and Configure Network Services
5. Install and Configure an LDAP Server
6. Centrally Configuring Client Settings

EVALUATION:

Student will be assessed through a variety of means. Evaluation may include, but is not limited to, the following: exams, quizzes, presentations, portfolios, discussions, class participation, attendance, projects, networking diagnosis, co-ops, practical, internships, externships, and research reports.

UNITS**Unit 1 Install and Setup A Server Operating System**General Outcome

- 1.0 The students shall learn how to install and setup a server operating system.

Specific Learning Outcomes

- 1.1 Plan for server installation
- 1.2 Plan for upgrade
- 1.3 Migrate services to new servers
- 1.4 Configure hostname
- 1.5 Configure IP Settings
- 1.6 Discuss differences between command line interface (CLI) and a graphic user interface (GUI)
- 1.7 Describe difference partition technology
- 1.8 Partition and format hard disk

Unit 2 Install Services**General Outcome**

- 2.0 The students shall learn how to install services on a server operating systems.

Specific Learning Outcomes

- 2.1 Create shares
- 2.2 Configure security permissions
- 2.3 Configure quotas
- 2.4 Install Printers
- 2.5 Share printers
- 2.6 Secure Printers
- 2.7 Configure remote management

Unit 3 Install and Configure Virtualization**General Outcome**

- 3.0 The students shall learn how to install and configure virtualization and to create virtual machines.

Specific Learning Outcomes

- 3.1 Install and configure virtualization technology
- 3.2 Create and configure virtual networks
- 3.3 Create and configure virtual storage

Unit 4 Deploy and Configure Network Services**General Outcome**

- 4.0 The students shall learn how to deploy and configure common network services such as DNS and DHCP.

Specific Learning Outcomes

- 4.1 Install and configure DNS service
- 4.2 Create DNS namespaces
- 4.3 Add resource records
- 4.4 Discuss the public DNS hierarchy
- 4.5 Install and configure DHCP service
- 4.6 Create zones
- 4.7 Configure local and global zone options

Unit 5 Install and Configure an LDAP Server**General Outcome**

- 5.0 The students shall learn how to install and configure an LDAP Server for centralized administration and authentication.

Specific Learning Outcomes

- 5.1 Install and configure LDAP service
5.2 Add users and groups to LDAP database
5.3 Discuss the relationship between DNS and LDAP

Unit 6 Centrally Configuring Client Settings**General Outcome**

- 6.0 The students shall learn how to configure client settings from a server.

Specific Learning Outcomes

- 6.1 Join clients to LDAP domain
6.2 Configure scripts and policy to control clients
6.3 Centrally configure firewall on client computers

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**BROWARD COLLEGE
COURSE OUTLINE**

Last Review:

Next Review:

COURSE TITLE: NETWORK+

COMMON COURSE NUMBER: CTS1134CU

EFFECTIVE TERM:

CREDIT HOURS: 4

CONTACT HOUR BREAKDOWN

(per 16 week term)

Lecture: 48

Lab: 16

Clinic: 0

Other: 0

College Placement Testing Requirements

N/A

Prerequisite

None

Corequisite

None

Pre/Corequisite

None

COURSE DESCRIPTION: This course provides students with important know- ledge and skills necessary to manage, maintain, "troubleshoot, install, operate and configure basic" network infrastructure; describe networking tech- nologies; basic design principles; and adhere to wiring standards and use testing tools.

UNIT TITLES

EVALUATION:

UNITS

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BROWARD COLLEGE COURSE OUTLINE

Last Review: 03/12/2015

Next Review: 08/01/2019

COURSE TITLE: NETWORKING TECHNOLOGY

COMMON COURSE NUMBER: CET2486C

EFFECTIVE TERM: Fall 2015

CREDIT HOURS: 3

CONTACT HOUR BREAKDOWN

(per 16 week term)

Lecture: 32

Lab: 32

Clinic:

Other:

College Placement Testing Requirements

N/A

Prerequisite

None

Corequisite

None

Pre/Corequisite

None

COURSE DESCRIPTION: This course covers topics in networking technology including OSI communications, networking and services, as well as troubleshooting of networking devices and components. Networking optimization is also included.

UNIT TITLES

1. Numbering Systems
2. Logical Addressing
3. Subnetting
4. VLSM

EVALUATION:

Evaluation instruments will include written and/or skills-based examination and individual in-class and/or take-home assignments. Evaluation methods may also include group in-class and/or take-home assignments.

UNITS**Unit 1 Numbering Systems**General Outcome

- 1.0 The students shall be able to describe the various numbering systems and learn how to convert from one number system to another.

Specific Learning Outcomes

- 1.1 Describe Decimal
- 1.2 Describe Binary
- 1.3 Describe Hexadecimal
- 1.4 Describe Octal
- 1.5 Binary to Decimal Conversion

- 1.6 Decimal to Binary Conversion
- 1.7 Binary to Hexadecimal Conversion
- 1.8 Hexadecimal to Binary Conversion
- 1.9 Binary to Octal Conversion
- 1.10 Octal to Binary Conversion
- 1.11 Octal to Hexadecimal Conversion
- 1.12 Hexadecimal to Octal Conversion

Unit 2 Logical Addressing

General Outcome

- 2.0 The students shall should be able to describe IPv4 and IPv6 logical addressing.

Specific Learning Outcomes

- 2.1 IPv4 Address
- 2.2 Network Address
- 2.3 Subnet Mask
- 2.4 Class Network Addresses
- 2.5 Default Subnet Mask
- 2.6 Hosts Per Classful Networks
- 2.7 Private Address Space (RFC 1918)
- 2.8 APIPA (RFC 3927)
- 2.9 IPv6 Global Unicast Addresses
- 2.10 IPv6 Link Local Addresses

Unit 3 Subnetting

General Outcome

- 3.0 The students shall learn to divide classful network addresses into more manageable smaller networks.

Specific Learning Outcomes

- 3.1 Subnetting a Class C network address when given the number of subnets to create
- 3.2 Subnetting a Class C network address when given the number of hosts each subnet should have
- 3.3 Subnetting a Class B network address when given the number of subnets to create
- 3.4 Subnetting a Class B network address when given the number of hosts each subnet should have
- 3.5 Subnetting a Class A network address when given the number of subnets to create
- 3.6 Subnetting a Class A network address when given the number of hosts each subnet should have

Unit 4 VLSM

General Outcome

- 4.0 The student shall learn to divide classful network addresses using variable length subnet masking which allows for the most efficient use of all bits.

Specific Learning Outcomes

- 4.1 Describe VLSM

- 4.2 Explain the differences between VLSM and traditional subnetting
- 4.3 Describe the powers of 2 chart
- 4.4 Divide classful network addresses using VLSM

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BROWARD COLLEGE COURSE OUTLINE

Last Review:

Next Review:

COURSE TITLE: PROJECT MANAGEMENT

COMMON COURSE NUMBER: CIS1513CU

EFFECTIVE TERM:

CREDIT HOURS: 3

CONTACT HOUR BREAKDOWN

(per 16 week term)

Lecture: 40

Lab: 8

Clinic: 0

Other: 0

College Placement Testing Requirements

N/A

Prerequisite

None

Corequisite

None

Pre/Corequisite

None

COURSE DESCRIPTION: "This course examines the organization, planning," and controlling of projects and provides practical "knowledge on managing project scope, schedule and" "resources. Topics include project life cycle," "work breakdown structure and Gantt charts, network" "diagrams, scheduling techniques, and resource" allocation decisions. Concepts are applied through team projects and tutorials using project management software. Prerequisite: CGS1060C or placement.

UNIT TITLES

EVALUATION:

UNITS

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BROWARD COLLEGE COURSE OUTLINE

Last Review: 03/09/2016

Next Review: 08/01/2020

COURSE TITLE: SECURITY+

COMMON COURSE NUMBER: CTS2120C

EFFECTIVE TERM: Fall 2016

CREDIT HOURS: 3

CONTACT HOUR BREAKDOWN (per 16 week term)

Lecture: 32

Lab: 16

Clinic:

Other:

College Placement Testing Requirements

N/A

Prerequisite

CTS1134C with a minimum grade of C

or

or

CET1600C with a minimum grade of C

Corequisite

None

Pre/Corequisite

None

COURSE DESCRIPTION: This course provides the student with an understanding of the computer, network, infrastructure, and information security issues faced by industry worldwide. Expertise necessary to combat and protect intellectual property from theft and destruction are also developed. The skills developed by students who complete this course will prepare them for the Security+ certification exam.

UNIT TITLES

1. Network Security
2. Compliance and Operation Security
3. Threats and Vulnerabilities
4. Application, Data and Host Security
5. Access Control and Identity Management
6. Cryptography

EVALUATION:

Evaluation instruments will include written and/or skills-based examinations and individual in-class and/or take-home assignments. Evaluation methods may also include group in-class and/or take-home assignments.

UNITS

Unit 1 Network Security

General Outcome

- 1.0 Understand Network Security

Specific Learning Outcomes

1.1 Implement security configuration parameters on network devices and other technologies

- Firewalls
- Routers
- Switches
- Load Balancers
- Proxies
- Web security gateways
- VPN concentrators
- NIDS and NIPS
 - Behavior based
 - Signature based
 - Anomaly based
 - Heuristic
- Protocol analyzers
- Spam filter
- UTM security appliances
 - URL filtering
 - Content inspection
 - Malware inspection
- Application aware devices
 - Firewalls
 - IPS
 - IDS
 - Proxies

1.2 Given a scenario, use secure network administration principles

- Rule-based management
- Firewall rules
- VLAN management
- Secure router configuration
- Access control lists
- Port Security
- 802.1x
- Flood guards
- Loop protection
- Implicit deny
- Network separation
- Unified Threat Management

1.3 Explain network design elements and components

- DMZ
- Subnetting
- VLAN
- NAT
- Remote Access
- Telephony
- NAC
- Virtualization
- Cloud Computing
 - Platform as a Service
 - Software as a Service
 - Infrastructure as a Service
 - Private
 - Public
 - Hybrid

- Community
 - Layered security / Defense in depth
- 1.4 Given a scenario, implement common protocols and services

- Protocols
 - IPSec
 - SNMP
 - SSH
 - DNS
 - TLS
 - SSL
 - TCP/IP
 - FTPS
 - HTTPS
 - SCP
 - ICMP
 - IPv4
 - IPv6
 - iSCSI
 - Fibre Channel
 - FCoE
 - FTP
 - SFTP
 - TFTP
 - TELNET
 - HTTP
 - NetBIOS
- Ports
 - 21
 - 22
 - 25
 - 53
 - 80
 - 110
 - 139
 - 143
 - 443
 - 3389
- OSI relevance

- 1.5 Implement wireless network in a secure manner

- WPA
- WPA2
- WEP
- EAP
- PEAP
- LEAP
- MAC filter
- Disable SSID broadcast
- TKIP
- CCMP
- Antenna Placement
- Power level controls
- Captive portals
- Antenna types

- Site surveys
- VPN (over open wireless)

Unit 2 Compliance and Operation Security

General Outcome

2.0 Understand Network Infrastructure

Specific Learning Outcomes

2.1 Explain risk related concepts

- Control types
 - Technical
 - Management
 - Operational
- False positives
- False negatives
- Importance of policies in reducing risk
 - Privacy policy
 - Acceptable use
 - Security policy
 - Mandatory vacations
 - Job rotation
 - Separation of duties
 - Least privilege
- Risk calculation
 - Likelihood
 - ALE
 - Impact
 - SLE
 - ARO
 - MTTR
 - MTTF
 - MTBF
- Quantitative vs. qualitative
- Vulnerabilities
- Threat vectors
- Probability / threat likelihood
- Risk-avoidance, transference, acceptance, mitigation, deterrence
- Risks associated to Cloud Computing and Virtualization
- Recovery time objective and recovery point objective

2.2 Summarize the security implications of intergrating systems and data with third parties

- On-boarding/off-boarding business partners
- Social media networks and/or applications
- Interoperability agreements
 - SLA
 - BPA
 - MOU
 - ISA
- Privacy considerations
- Risk awareness
- Unauthorized data sharing
- Data ownership
- Data backups

- Follow security policy and procedures
 - Review agreement requirements to verify compliance and performance standards
- 2.3 Given a scenario, implement appropriate risk mitigation strategies
- Change management
 - Incident management
 - User rights and permissions reviews
 - Perform routine audits
 - Enforce policies and procedures to prevent data loss or theft
 - Enforce technology controls
 - Data Loss Prevention (DLP)
- 2.4 Given a scenario, implement basic forensic procedures
- Order of volatility
 - Capture system image
 - Network traffic and logs
 - Capture video
 - Record time offset
 - Take hashes
 - Screenshots
 - Witnesses
 - Track man hours and expense
 - Chain of custody
 - Big Data analysis
- 2.5 Summarize common incident response procedures
- Preparation
 - Incident identification
 - Escalation and notification
 - Mitigation steps
 - Lessons learned
 - Reporting
 - Recovery/reconstitution procedures
 - First responder
 - Incident isolation
 - Quarantine
 - Device removal
 - Data breach
 - Damage and loss control
- 2.6 Explain the importance of security related awareness and training
- Security policy training and procedures
 - Role-based training
 - Personally identifiable information
 - Information classification
 - High
 - Medium
 - Low
 - Confidential
 - Private
 - Public
 - Data labeling, handling and disposal
 - Compliance with laws, best practices and standards
 - User habits
 - Password behaviors
 - Data handling

- Clean desk policies
 - Prevent tailgating
 - Personally owned devices
 - Threat awareness
 - New viruses
 - Phishing attacks
 - Zero days exploits
 - Use of social networking and P2P
 - Follow up and gather training metrics to validate compliance and security posture
- 2.7 Compare and contrast physical security and environmental controls
- Environmental controls
 - HVAC
 - Fire suppression
 - EMI shielding
 - Hot and cold aisles
 - Environmental monitoring
 - Temperature and humidity controls
 - Physical security
 - Hardware locks
 - Mantraps
 - Video Surveillance
 - Fencing
 - Proximity readers
 - Access list
 - Proper lighting
 - Signs
 - Guards
 - Barricades
 - Biometrics
 - Protected distribution (cabling)
 - Alarms
 - Motion detection
 - Control types
 - Deterrent
 - Preventive
 - Detective
 - Compensating
 - Technical
 - Administrative
- 2.8 Summarize risk management best practices
- Business Continuity concepts
 - Business impact analysis
 - Identification of critical systems and components
 - removing single points of failure
 - business continuity planning and testing
 - Risk assessment
 - Continuity of operations
 - Disaster recovery
 - IT contingency planning
 - Succession planning
 - High availability
 - Redundancy
 - Tabletop exercise

- Fault tolerance
 - Hardware
 - RAID
 - Clustering
 - Load balancing
 - Servers
- Disaster recovery concepts
 - Backup plans/policies
 - Backup execution/frequency
 - Cold site
 - Hot site
 - Warm site

2.9 Given a scenario, select the appropriate control to meet the goals of security

- Confidentiality
 - Encryption
 - Access controls
 - Steganography
- Integrity
 - Hashing
 - Digital signatures
 - Certificates
 - Non-repudiation
- Availability
 - Redundancy
 - Fault tolerance
 - Patching
- Safety
 - Fencing
 - Lighting
 - Locks
 - CCTV
 - Escape plans
 - Drills
 - Escape routes
 - Testing controls

Unit 3 Threats and Vulnerabilities

General Outcome

3.0 Understand Access Control

Specific Learning Outcomes

3.1 Explain types of malware

- Adware
- Virus
- Worms
- Spyware
- Trojan
- Rootkits
- Backdoors
- Logic bomb
- Botnets
- Ransomware

- Polymorphic malware
 - Armored virus
- 3.2 Summarize various types of attacks
- Man-in-the-middle
 - DDoS
 - DoS
 - Replay
 - Smurf attack
 - Spoofing
 - Spam
 - Phishing
 - Spim
 - Vishing
 - Spear phishing
 - Xmas attack
 - Pharming
 - Privilege escalation
 - Malicious insider threat
 - DNS poisoning and ARP poisoning
 - Transitive access
 - Client-side attacks
 - Password attacks
 - Brute force
 - Dictionary attacks
 - Hybrid
 - Birthday attacks
 - Rainbow tables
 - Typsquatting/URL hijacking
 - Watering hole attack
- 3.3 Summarize social engineering attacks and the associated effectiveness with each attack
- Shoulder surfing
 - Dumpster diving
 - Tailgating
 - Impersonation
 - Hoaxes
 - Whaling
 - Vishing
 - Principles (reasons for effectiveness)
 - Authority
 - Intimidation
 - Consensus/Social proof
 - Scarcity
 - Urgency
 - Familiarity/liking
 - Trust
- 3.4 Explain types of wireless attacks
- Rogue access points
 - Jamming/Interference
 - Evil twin
 - War driving
 - Bluejacking

- Bluesnarfing
 - War chalking
 - IV attack
 - Packet sniffing
 - Near field communication
 - Replay attacks
 - WEP/WPA attacks
 - WPS attacks
- 3.5 Explain types of application attacks
- Cross-site scripting
 - SQL injection
 - LDAP injection
 - XML injection
 - Directory traversal/command injection
 - Buffer overflow
 - Integer overflow
 - Zero-day
 - Cookies and attachments
 - LSO (Locally Shared Objects)
 - Flash Cookies
 - Malicious add-ons
 - Session hijacking
 - Header manipulation
 - Arbitrary code execution / remote code execution
- 3.6 Analyze a scenario and select the appropriate type of mitigation and deterrent techniques
- Monitoring system logs
 - Event logs
 - Audit logs
 - Security logs
 - Access logs
 - Hardening
 - Disabling unnecessary services
 - Protecting management interfaces and applications
 - Password protection
 - Disabling unnecessary accounts
 - Network security
 - MAC limiting and filtering
 - 802.1x
 - Disabling unused interfaces and unused application service ports
 - Rogue machine detection
 - Security posture
 - Initial baseline configuration
 - Continuous security monitoring
 - Remediation
 - Reporting
 - Alarms
 - Alerts
 - Trends
 - Detection controls vs. prevention controls
 - IDS vs. IPS
 - Camera vs. guard

3.7 Given a scenario, use appropriate tools and techniques to discover security threats and vulnerabilities

- Interpret results of security assessment tools
- Tools
 - Protocol analyzer
 - Vulnerability scanner
 - Honeypots
 - Honeynets
 - Port scanner
 - Passive vs. active tools
 - Banner grabbing
- Risk calculations
 - Threat vs. likelihood
- Assessment types
 - Risk
 - Threat
 - Vulnerability
- Assessment technique
- Baseline reporting
 - Code review
 - Determine attack surface
 - Review architecture
 - Review designs

3.8 Explain the proper use of penetration testing versus vulnerability scanning

- Penetration testing
 - Verify a threat exists
 - Bypass security controls
 - Actively test security controls
 - Exploiting vulnerabilities
- Vulnerability scanning
 - Passively testing security controls
 - Identify vulnerability
 - Identify lack of security controls
 - Identify common misconfiguration
 - Intrusive vs. non-intrusive
 - Credentialed vs. non-credentialed
 - False positive
- Black box
- White box
- Gray box

Unit 4 Application, Data and Host Security

General Outcome

4.0 Understand Assessments & Audits

Specific Learning Outcomes

4.1 Explain the importance of application security controls and techniques

- Fuzzing
- Secure coding concepts
 - Error and exception handling
 - Input validation
- Cross-site scripting prevention

- Cross-site Request Forgery (XSRF) prevention
- Application configuration baseline (proper settings)
- Application hardening
- Application patch management
- NoSQL databases vs. SQL databases
- Server-side vs. Client-side validation

4.2 Summarize mobile security concepts and technologies

- Device security
 - Full device encryption
 - Remote wiping
 - Lockout
 - Screen-locks
 - GPS
 - Application control
 - Storage segmentation
 - Asset tracking
 - Inventory control
 - Mobile device management
 - Device access control
 - Removable storage
 - Disabling unused features
- Application security
 - Key management
 - Credential management
 - Authentication
 - Geo-tagging
 - Encryption
 - Application whitelisting
 - Transitive trust/authentication
- BYOD concerns
 - Data ownership
 - Support ownership
 - Patch management
 - Antivirus management
 - Forensics
 - Privacy
 - On-boarding/off-boarding
 - Adherence to corporate policies
 - User acceptance
 - Architecture/infrastructure considerations
 - Legal concerns
 - Acceptable use policy
 - On-board camera/video

4.3 Given a scenario, select the appropriate solution to establish host security

- Operating system security and settings
- OS hardening
- Anti-malware
 - Antivirus
 - Anti-spam
 - Anti-spyware
 - Pop-up blockers
- Patch management
- White listing vs. black listing applications

- Trusted OS
- Host-based firewalls
- Host-based intrusion detection
- Hardware security
 - Cable locks
 - Safe
 - Locking cabinets
- Host software baselining
- Virtualization
 - Snapshots
 - Patch compatibility
 - Host availability/elasticity
 - Security control testing
 - Sandboxing

4.4 Implement the appropriate controls to ensure data security

- Cloud storage
- SAN
- Handling Big Data
- Data encryption
 - Full disk
 - Database
 - Individual files
 - Removable media
 - Mobile devices
- Hardware based encryption devices
 - TPM
 - HSM
 - USB encryption
 - Hard drive
- Data in-transit, Data at-rest, Data in-use
- Permissions/ACL
- Data policies
 - Wiping
 - Disposing
 - Retention
 - Storage

4.5 Compare and contrast alternative methods to mitigate security risks in static environments

- Environments
 - SCADA
 - Embedded (Printer, Smart TV, HVAC control)
 - Android
 - iOS
 - Mainframe
 - Game consoles
 - In-vehicle computing systems
- Methods
 - Network segmentation
 - Security layers
 - Application firewalls
 - Manual updates
 - Firmware version control
 - Wrappers
 - Control redundancy and diversity

Unit 5 Access Control and Identity Management**General Outcome**

5.0 Understand Cryptography

Specific Learning Outcomes

5.1 Compare and contrast the function and purpose of authentication services

- RADIUS
- TACACS
- TACACS+
- Kerberos
- LDAP
- XTACACS
- SAML
- Secure LDAP

5.2 Given a scenario, select the appropriate authentication, authorization or access control

- Identification vs. authentication vs. authorization
- Authorization
 - Least privilege
 - Separation of duties
 - ACLs
 - Mandatory access
 - Discretionary access
 - Rule-based access control
 - Role-based access control
 - Time of day restrictions
- Authentication
 - Tokens
 - Common access card
 - Smart card
 - Multifactor authentication
 - TOTP
 - HOTP
 - CHAP
 - PAP
 - Single sign-on
 - Access control
 - Implicit deny
 - Trusted OS
- Authentication factors
 - Something you are
 - Something you have
 - Something you know
 - Somewhere you are
 - Something you do
- Identification
 - Biometrics
 - Personal identification verification card
 - Username
- Federation
- Transitive trust/authentication

- 5.3 Install and configure security controls when performing account management, based on best practices
- Mitigate issues associated with users with multiple account/roles and/or shared accounts
 - Account policy enforcement
 - Credential management
 - Group policy
 - Password complexity
 - Expiration
 - Recovery
 - Disablement
 - Lockout
 - Password history
 - Password reuse
 - Password length
 - Generic account prohibition
 - Group based privileges
 - User assigned privileges
 - User access reviews
 - Continuous monitoring

Unit 6 **Cryptography**

General Outcome

- 6.0 Understand Organization Security

Specific Learning Outcomes

- 6.1 Given a scenario, utilize general cryptography concepts
- Symmetric vs. asymmetric
 - Session Key
 - In-band vs. out-of-band key exchange
 - Fundamental differences and encryption methods
 - Block vs. stream
 - Transport encryption
 - Non-repudiation
 - Hashing
 - Key escrow
 - Steganography
 - Digital signatures
 - Use of proven technologies
 - Elliptic curve and quantum cryptography
 - Ephemeral key
 - Perfect forward secrecy
- 6.2 Given a scenario, use appropriate cryptographic methods
- WEP vs. WPA/WPA2 and preshared key
 - MD5
 - SHA
 - RIPEMD
 - AES
 - DES
 - 3DES
 - HMAC
 - RSA

- Diffie-Hellman
- RC4
- One-time-pads
- NTLM
- NTLMv2
- Blowfish
- PGP/GPG
- TwoFish
- DHE
- ECDHE
- CHAP
- PAP
- Comparative strengths and performance of algorithms
- Use of algorithms with transport encryption
 - SSL
 - TLS
 - IPSec
 - SSH
 - HTTPS
- Cipher suites
 - Strong vs. weak ciphers
- Key stretching
 - PBKDF2
 - Bcrypt

6.3 Explain the core concepts of public key infrastructure

- Certificate authorities and digital certificates
 - CA
 - CRLs
- PKI
- Recovery agent
- Public key
- Private key
- Registration
- Key escrow
- Trust models

6.4 Given a scenario, use appropriate PKI, certificate management and associated components

- Certificate authorities and digital certificates
 - CA
 - CRLs
 - OCSP
 - CSR
- PKI
- Recovery agent
- Public key
- Private keys
- Registration
- Key escrow
- Trust models

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BROWARD COLLEGE COURSE OUTLINE

Last Review: 08/01/2011

Next Review: 08/01/2016

COURSE TITLE: UNIX

COMMON COURSE NUMBER: CTS1106C

EFFECTIVE TERM:

CREDIT HOURS: 3

CONTACT HOUR BREAKDOWN

(per 16 week term)

Lecture: 48

Lab: 16

Clinic: 0

Other: 0

College Placement Testing Requirements

N/A

Prerequisite

None

Corequisite

None

Pre/Corequisite

None

COURSE DESCRIPTION: The UNIX Operating System Essentials course provides instruction in the key features and capabilities of the UNIX OS. Topics include file and directory management, controlling the user work environment, archiving files and using remote commands. In addition, this course explains fundamental command-line features of the UNIX OS, including file system navigation, the vi text editor, file permissions, access control lists (ACLs), command shells, file compression, basic network use, and reading shell scripts. This course prepares students to take the Sun Certified Solaris Associate (SCSAS) Exam.

UNIT TITLES

1. Using the Desktop in the UNIX Operating System
2. Using Command-Line Features and Online Help Resources
3. Viewing Directories and Files
4. Working with files and Directories in UNIX
5. Using the vi Editor
6. Using Commands Within the Shell
7. Using Basic File Permissions
8. Configure Access Control Lists (ACLs)
9. Searching Files and Directories
10. Performing Basic Process Control
11. Advanced Shell Functionality
12. Reading Shell Scripts
13. Creating Archives
14. Compressing, Viewing, and Uncompressing Files
15. Performing Remote Connections and File Transfers

EVALUATION:**UNITS**

- Unit 1 Using the Desktop in the UNIX Operating System**

General Outcome

- 1.0 The student shall: be able to use the desktop in the UNIX operating system.

Specific Learning Outcomes

- 1.1 Describe the hardware components of a computer.
1.2 Describe the UNIX operating system components.
1.3 Describe the UNIX operating system.
1.4 Log in to the system.
1.5 Use the desktop environment.

Unit 2 Using Command-Line Features and Online Help ResourcesGeneral Outcome

- 2.0 The student shall: be able to use command-line features and online help resources.

Specific Learning Outcomes

- 2.1 Construct and execute commands from the command line.
2.2 Use online documentation.

Unit 3 Viewing Directories and FilesGeneral Outcome

- 3.0 The student shall: be able to view directories and files.

Specific Learning Outcomes

- 3.1 Work with directories.
3.2 Work with files.
3.3 Print files.

Unit 4 Working with files and Directories in UNIXGeneral Outcome

- 4.0 The student shall: be able to work with files and directories in UNIX.

Specific Learning Outcomes

- 4.1 Copy files and directories.
4.2 Move and rename files and directories.
4.3 Create files and directories.
4.4 Remove files and directories.
4.5 Use symbolic links.

Unit 5 Using the vi EditorGeneral Outcome

- 5.0 The student shall: be able to use the vi editor.

Specific Learning Outcomes

- 5.1 Describe the fundamentals of the vi editor.
5.2 Modify files by using the vi editor.

Unit 6 Using Commands Within the Shell**General Outcome**

6.0 The student shall: be able to use commands within the shell.

Specific Learning Outcomes

- 6.1 Use shell metacharacters.
- 6.2 Describe the Korn shell variables.
- 6.3 Display the command history.
- 6.4 Describe the command-line interpreter.
- 6.5 Work with user initialization files

Unit 7 Using Basic File Permissions**General Outcome**

7.0 The student shall: be able to use basic file permissions.

Specific Learning Outcomes

- 7.1 View file and directory permissions.
- 7.2 Determine file or directory access.
- 7.3 Change the permissions.
- 7.4 Modify the default permissions

Unit 8 Configure Access Control Lists (ACLs)**General Outcome**

8.0 The student shall: be able to configure access control lists.

Specific Learning Outcomes

- 8.1 Describe ACLs.
- 8.2 Configure ACLs by using the command line.
- 8.3 Configure ACLs using the File Manager graphical user interface (GUI).

Unit 9 Searching Files and Directories**General Outcome**

9.0 The student shall: be able to search files and directories.

Specific Learning Outcomes

- 9.1 Search for content in files.
- 9.2 Search for files and directories

Unit 10 Performing Basic Process Control**General Outcome**

10.0 The student shall: be able to perform basic process control.

Specific Learning Outcomes

- 10.1 Describe UNIX processes.
- 10.2 View a process.

- 10.3 Search for a specific process.
- 10.4 Send a signal to a process.
- 10.5 The student shall: be able to use advanced shell functionality.

Unit 11 Advanced Shell Functionality**General Outcome**

- 11.0 The student shall: be able to use advanced shell functionality.

Specific Learning Outcomes

- 11.1 Manage jobs in the Korn shell.
- 11.2 Describe the Korn shell alias utility.
- 11.3 Use Korn shell functions.
- 11.4 Set Korn shell options.

Unit 12 Reading Shell Scripts**General Outcome**

- 12.0 The student shall: be able to read shell scripts.

Specific Learning Outcomes

- 12.1 Describe shell scripts.
- 12.2 Run shell scripts.
- 12.3 Pass values to shell scripts
- 12.4 Use the test command.
- 12.5 Perform conditional commands.

Unit 13 Creating Archives**General Outcome**

- 13.0 The student shall: be able to create archives.

Specific Learning Outcomes

- 13.1 Archive files.
- 13.2 Compress and archive files using the jar command.

Unit 14 Compressing, Viewing, and Uncompressing Files**General Outcome**

- 14.0 The student shall: be able to compress, view and uncompress files.

Specific Learning Outcomes

- 14.1 Compress files using the compress command.
- 14.2 View compressed files using the zcat command.
- 14.3 Uncompress files using the uncompress command.
- 14.4 Compress a file with the gzip command.
- 14.5 View files using the gzcat command.
- 14.6 Compress and archive multiple files with the zip command.

Unit 15 Performing Remote Connections and File Transfers

General Outcome

- 15.0 The student shall: be able to perform remote connections and file transfers.

Specific Learning Outcomes

- 15.1 Establish a remote login session.
15.2 Copy files or directories to and from another system.
15.3 Transfer files between systems.

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BROWARD COLLEGE COURSE OUTLINE

Last Review: 03/09/2016

Next Review: 08/01/2020

COURSE TITLE: Administering Windows Server 2012

COMMON COURSE NUMBER: CTS1391C

EFFECTIVE TERM: Fall 2016

CREDIT HOURS: 3

CONTACT HOUR BREAKDOWN

(per 16 week term)

Lecture: 32

Lab: 16

Clinic:

Other:

College Placement Testing Requirements

N/A

Prerequisite

CTS1390C with a minimum grade of C

Corequisite

None

Pre/Corequisite

None

COURSE DESCRIPTION: This course will give students the skills to maintain a Windows Server 2012 infrastructure, such as user and group management, network access and data security.

UNIT TITLES

1. Deploy, Manage, and Maintain Servers
2. Configure File and Print Services
3. Configure Network Services and Access
4. Configure a Network Policy Server Infrastructure
5. Configure and Manage Active Directory
6. Configure and Manage Group Policy

EVALUATION:

Evaluation instruments will include written and/or skills-based examination and individual in-class and/or take-home assignments. Evaluation methods may also include group in-class and/or take-home assignments.

UNITS

Unit 1 **Deploy, Manage, and Maintain Servers**

General Outcome

- 1.0 Students will be able to deploy, manage, and maintain servers.

Specific Learning Outcomes

- 1.1 • Deploy and manage server images.
- This objective may include but is not limited to: Install the Windows Deployment Services (WDS) role; configure and manage boot, install, and discover images; update images with patches, hotfixes, and drivers; install features for offline images

- 1.2 • Implement patch management.
 - This objective may include but is not limited to: Install and configure the Windows Server Update Services (WSUS) role; configure group policies for updates; configure client-side targeting; configure WSUS synchronization; configure WSUS groups
- 1.3 • Monitor servers.
 - This objective may include but is not limited to: Configure Data Collector Sets (DCS); configure alerts; monitor real-time performance; monitor virtual machines (VMs); monitor events; configure event subscriptions; configure network monitoring

Unit 2 Configure File and Print Services

General Outcome

- 2.0 Students will be able to configure file and print services.

Specific Learning Outcomes

- 2.1 • Configure Distributed File System (DFS).
 - This objective may include but is not limited to: Install and configure DFS namespaces; configure DFS Replication Targets; configure Replication Scheduling; configure Remote Differential Compression settings; configure staging; configure fault tolerance
- 2.2 • Configure File Server Resource Manager (FSRM).
 - This objective may include but is not limited to: Install the FSRM role; configure quotas; configure file screens; configure reports
- 2.3 • Configure file and disk encryption.
 - This objective may include but is not limited to: Configure Bitlocker encryption; configure the Network Unlock feature; configure Bitlocker policies; configure the EFS recovery agent; manage EFS and Bitlocker certificates including backup and restore
- 2.4 • Configure advanced audit policies.
 - This objective may include but is not limited to: Implement auditing using Group Policy and AuditPol.exe; create expression-based audit policies; create removable device audit policies

Unit 3 Configure Network Services and Access

General Outcome

- 3.0 Students will be able to configure network services and access.

Specific Learning Outcomes

- 3.1 • Configure DNS zones.
 - This objective may include but is not limited to: Configure primary and secondary zones; configure stub zones; configure conditional forwards; configure zone and conditional forward storage in Active Directory; configure zone delegation; configure zone transfer settings; configure notify settings
- 3.2 • Configure DNS records.
 - This objective may include but is not limited to: Create and configure DNS Resource Records (RR) including A, AAAA, PTR, SOA, NS, SRV, CNAME, and MX records; configure zone scavenging; configure record options including Time To Live (TTL) and weight; configure round robin; configure secure dynamic updates

- 3.3 • Configure VPN and routing.
 - This objective may include but is not limited to: Install and configure the Remote Access role; implement Network Address Translation (NAT); configure VPN settings; configure remote dial-in settings for users; configure routing
- 3.4 • Configure DirectAccess.
 - This objective may include but is not limited to: Implement server requirements; implement client configuration; configure DNS for Direct Access; configure certificates for Direct Access

Unit 4 Configure a Network Policy Server Infrastructure

General Outcome

- 4.0 Students will be able to configure a network policy server infrastructure.

Specific Learning Outcomes

- 4.1 • Configure Network Policy Server (NPS).
 - This objective may include but is not limited to: Configure multiple RADIUS server infrastructures; configure RADIUS clients; manage RADIUS templates; configure RADIUS accounting; configure certificates
- 4.2 • Configure NPS policies.
 - This objective may include but is not limited to: Configure connection request policies; configure network policies for VPN clients (multilink and bandwidth allocation, IP filters, encryption, IP addressing); manage NPS templates; import and export NPS policies
- 4.3 • Configure Network Access Protection (NAP).
 - This objective may include but is not limited to: Configure System Health Validators (SHVs); configure health policies; configure NAP enforcement using DHCP and VPN; configure isolation and remediation of non-compliant computers using DHCP and VPN; configure NAP client settings

Unit 5 Configure and Manage Active Directory

General Outcome

- 5.0 Students will be able to configure and manage Active Directory.

Specific Learning Outcomes

- 5.1 • Configure service authentication.
 - This objective may include but is not limited to: Create and configure Service Accounts; create and configure Group Managed Service Accounts; create and configure Managed Service Accounts; configure Kerberos delegation; manage Service Principal Names (SPNs)
- 5.2 • Configure Domain Controllers.
 - This objective may include but is not limited to: Configure Universal Group Membership Caching (UGMC); transfer and seize operations masters; install and configure a read-only domain controller (RODC); configure Domain Controller cloning
- 5.3 • Maintain Active Directory.
 - This objective may include but is not limited to: Back up Active Directory and SYSVOL; manage Active Directory offline; optimize an Active Directory database; clean up metadata; configure Active Directory snapshots; perform object- and container-level recovery; perform Active Directory restore

- 5.4
- Configure account policies.
 - This objective may include but is not limited to: Configure domain user password policy; configure and apply Password Settings Objects (PSOs); delegate password settings management; configure local user password policy; configure account lockout settings

Unit 6 **Configure and Manage Group Policy**

General Outcome

- 6.0 Students will be able configure and manage group policy.

Specific Learning Outcomes

- 6.1
- Configure Group Policy processing.
 - This objective may include but is not limited to: Configure processing order and precedence; configure blocking of inheritance; configure enforced policies; configure security filtering and WMI filtering; configure loopback processing; configure and manage slow-link processing; configure client-side extension (CSE) behavior
- 6.2
- Configure Group Policy settings.
 - This objective may include but is not limited to: Configure settings including software installation, folder redirection, scripts, and administrative template settings; import security templates; import custom administrative template file; convert administrative templates using ADMX Migrator; configure property filters for administrative templates
- 6.3
- Manage Group Policy objects (GPOs).
 - This objective may include but is not limited to: Back up, import, copy, and restore GPOs; create and configure Migration Table; reset default GPOs; delegate Group Policy management
- 6.4
- Configure Group Policy preferences.
 - This objective may include but is not limited to: Configure Group Policy Preferences (GPP) settings including printers, network drive mappings, power options, custom registry settings, Control Panel settings, Internet Explorer settings, file and folder deployment, and shortcut deployment; configure item-level targeting

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5.4 Troubleshoot name resolution problems.

Unit 6 Managing & Maintaining Domain Name System

General Outcome

6.0 The students should be able to manage and maintain DNS service.

Specific Learning Outcomes

6.1 Install DNS and create forward and reverse lookup zones in master-slave, ADIZ, stub or caching-only server mode.

6.2 Describe the relationship between Directory Services, DHCP and DNS.

6.3 Manage DNS zones, and zone transfers, bindings, forwarding, logging and zone security.

6.4 Implement fault tolerance and integrate DNS.

6.5 Perform backup and restoration.

Unit 7 Managing Network Files and System Security

General Outcome

7.0 The students should be able to set up and manage files and file system security.

Specific Learning Outcomes

7.1 Manage file objects in Windows Server.

7.2 Use share names on a Windows Server network.

7.3 Implement file systems security using file permissions.

7.4 Enhance file systems security through auditing.

Unit 8 Managing Windows Server Registry

General Outcome

8.0 The students should be able to manage and update service registry.

Specific Learning Outcomes

8.1 Describe the Windows Server registry.

8.2 Describe practical uses of the registry.

8.3 Perform registry operations.

8.4 Describe the Windows Server registry and boot sequence.

Unit 9 Supporting Network Clients

General Outcome

9.0 The students should be able to install and manage client software.

Specific Learning Outcomes

9.1 Explain the architecture of network clients.

9.2 Use the network client administrator tools.

9.3 Install the network client software.

Unit 10 Integrating a Multi-Platform Network Environment

General Outcome

- 10.0 The students should be able to integrate Windows Server servers with UNIX/Linux and other commonly used network operating systems.

Specific Learning Outcomes

- 10.1 Integrate various UNIX/Linux services into a Windows network.
10.2 Integrate other network environments.

Unit 11 Installing and Configuring Basic TCP/IP Services

General Outcome

- 11.0 The students should be able to implement TCP/IP for a Windows Server server.

Specific Learning Outcomes

- 11.1 Install and configure TCP/IP services.
11.2 Install SNMP support for Windows Server.
11.3 Configure Windows Server and IP router.
11.4 Install and configure HTTP and/or FTP services.
11.5 Use TCP/IP command line tools.

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BROWARD COLLEGE COURSE OUTLINE

Last Review: 05/08/2016

Next Review: 08/01/2020

COURSE TITLE: Web Authoring 1

COMMON COURSE NUMBER: CTS1851C

EFFECTIVE TERM: Fall 2016

CREDIT HOURS: 3

CONTACT HOUR BREAKDOWN (per 16 week term)

Lecture: 32

Lab: 16

Clinic:

Other:

College Placement Testing Requirements

N/A

Prerequisite

CIS1000C with a minimum grade of C

or

CGS1060C with a minimum grade of C or Placement

Corequisite

None

Pre/Corequisite

None

COURSE DESCRIPTION: This course is an entry - level course that provides students with baseline technical knowledge and skills of Internet, intranet, and extranet technologies. Students will gain a basic knowledge and/or competency of Internet skills and tasks in 3 core content areas: Internet Business Foundations, Site Development Foundations, and Network Technology Foundations. The skills developed by students completing this course will help prepare them for the CIW Foundations certification exam. Placement test or CGS1060C

UNIT TITLES

1. Internet Business Foundations
2. Site Development Foundations
3. Network Technology Foundations

EVALUATION:

Evaluation instruments will include written and/or skills-based examinations and individual in-class and/or take-home assignments. Evaluation methods may also include group in-class and/or take-home assignments.

UNITS

Unit 1 **Internet Business Foundations**

General Outcome

- 1.0 **The student shall identify and understand Internet connection methods and protocols, the Domain Name System (DNS), basic functions of Web browsers, the components of Web Addresses, the use and control of cookies, how plug-ins can improve Web browsing, databases (as they relate to Web search engines), email client configuration, instant messaging and newsgroup use, the risks associated with being connected to the Internet and security measures that can keep their system and their personal information secure, and the fundamental elements of project management and the importance of acquiring these skills for all IT job roles.**

Specific Learning Outcomes

- 1.1 Identify job roles in the Information Technology (IT) industry, including the responsibilities, tasks and skills they require.
- 1.2 Identify the infrastructure required to access the Internet, including hardware and software components.
- 1.3 Define important Internet communications protocols and their roles in delivering basic Internet services.
- 1.4 Identify the basic principles of the Domain Name System (DNS).
- 1.5 Identify the functions of Web browsers, and use them to access the World Wide Web and other computer resources.
- 1.6 Use e-mail clients to send simple messages and files to other Internet users.
- 1.7 Define and use additional networking and Internet services.
- 1.8 Demonstrate ways to communicate effectively using Internet technology.
- 1.9 Identify and configure user customization features in Web browsers, including: preferences, caching, cookies.
- 1.10 Identify security issues related to Internet clients (e.g., Web browsers, e-mail, instant messaging) in the workplace, including: certificates, malware, illicit servers, viruses.
- 1.11 Use different types of Web search engines effectively.
- 1.12 Identify and use principles of Personal Information Management (PIM), including: common applications.
- 1.13 Efficiently transmit text and binary files using popular Internet services.
- 1.14 Identify security-related ethical and legal issues faced by IT professionals.
- 1.15 Relate project management concepts and terms to the IT profession.
- 1.16 Recognize essential database concepts.
- 1.17 **Conduct a Webcast and related services.**
- 1.18 **Distinguish between proprietary and open-source development models.**
- 1.19 **Define essential social networking and Web 2.0 concepts.**
- 1.20 **Manage career opportunities in the IT industry.**
- 1.21 **Represent technical issues to a nontechnical audience.**

Unit 2 Site Development FoundationsGeneral Outcome

- 2.0 The student shall develop Web sites using Hypertext Markup Language (HTML) and Extensible HTML (XHTML) by writing code manually, as well as through graphical user interface (GUI) authoring tools and use CGI to connect Web pages to databases. Additionally, the student shall learn to validate XHTML code, recognize the importance of marketing, implement fundamental design concepts, identify ecommerce solutions and relate Web site development to business goals as a productive part of a Web site development team.**

Specific Learning Outcomes

- 2.1 **Demonstrate knowledge required to create a Web page.**
- 2.2 **Add images and graphical formatting to HTML files, and create and edit images and audio.**
- 2.3 Identify and use design and color principles for Web pages.
- 2.4 Create a basic HTML form that accepts user input.

- 2.5 Define Extensible Markup Language (XML), and identify its features and appropriate use.
- 2.6 Identify essential Web site navigation issues, and ensure page/site accessibility.
- 2.7 **Define and apply essential aspects of the Cascading Style Sheets (CSS) standard, including CSS versions 1, 2 and 3.**
- 2.8 **Use the most current version of Hypertext Markup Language (HTML5) to create Web pages.**
- 2.9 Identify technologies for enhancing the user's Web experience, including: programming languages, multimedia technologies.
- 2.10 Use GUI-based HTML editing software to create Web pages.
- 2.11 Test and analyze Web site performance issues.
- 2.12 Identify steps in the Web site planning and development process.
- 2.13 Identify essential issues in developing and maintaining a Web site, including: project management, testing, legal issues.
- 2.14 Plan and deliver oral presentations of your Web site, during and after site development.
- 2.15 Define electronic commerce (e-commerce) and related technologies and concepts necessary to develop a secure, useful interface (i.e., storefront).
- 2.16 Demonstrate knowledge of languages commonly used to provide database connectivity to Web sites.
- 2.17 Identify the benefits and drawbacks of running your own Web server versus using a service provider.
- 2.18 Identify common strategies for managing an end user's experience and improving site creativity.
- 2.19 **Consider copyright and ethical issues when creating Web pages.**
- 2.20 **Design Web pages to industry standards.**

Unit 3 Network Technology Foundations

General Outcome

- 3.0 **The student shall demonstrate the use of various network components and protocols that enable users to share data quickly and easily, and explain how network architecture and topologies provide for efficient and secure communication. In addition, the student will learn about the OSI reference model and its relationship to packet creation, and will be able compare and contrast the OSI model with the Internet architecture model. The student will study the functions and features of internetworking server types, and will achieve competency in performing basic hardware and operating system maintenance procedures. In addition, the student will learn about the importance of RFCs and where to locate the most recent RFC documents. The student will also be able to explain routing and its use of IP addressing, IP address classes and subnet masks. The student will also be able to demonstrate an understanding of network security concepts, including authentication, encryption and firewalls.**

Specific Learning Outcomes

- 3.1 Demonstrate knowledge of basic data communications components, and demonstrate technical knowledge of the Internet.
- 3.2 Identify the role of networking hardware, and configure common hardware for operation.
- 3.3 Identify the relationship between IP addresses and domain names, including: assignment of IP addresses within a subnet.
- 3.4 Identify the functions and components of servers commonly used on the Internet.
- 3.5 Identify common Internet security and availability issues, including: user-level and enterprise-level concerns.

- 3.6 Identify common performance issues affecting Internet clients, including: analysis, diagnosis.
- 3.7 Perform basic hardware and system maintenance for network-aware systems.
- 3.8 Manage fundamental elements of modern network-based client operating systems.
- 3.9 Configure and troubleshoot wireless networks.
- 3.10 **Demonstrate understanding of virtualization.**
- 3.11 **Explain concepts involving personal privacy protection on the Internet.**

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BROWARD COLLEGE COURSE OUTLINE

Last Review: 03/12/2015

Next Review: 08/01/2019

COURSE TITLE: COMPUTER APPLICATIONS**COMMON COURSE NUMBER:** CGS2100C**EFFECTIVE TERM:** Fall 2015**CREDIT HOURS:** 3**CONTACT HOUR BREAKDOWN**

(per 16 week term)

Lecture: 32

Lab: 16

Clinic:

Other:

College Placement Testing Requirements

N/A

Prerequisite

CGS1060C with a minimum grade of C

or

CIS1000C with a minimum grade of C

or

Placement with a minimum grade of a C

Corequisite

None

Pre/Corequisite

None

COURSE DESCRIPTION: This is an intermediate-level course in computer applications software. Students will gain knowledge and experience in the use and capabilities of word-processing, spreadsheet, database, and presentation graphics applications. Through case studies, students will learn to develop comprehensive solutions to various types of problems. Integration between applications will be emphasized.

UNIT TITLES

1. Working on a Group Project
2. Document Formats, Columns, Charts, Special Effects, and Styles
3. Working with Tables, Graphics, and Objects
4. Mail Merge and Automating Mass Mailings
5. Advanced Spreadsheet Functions
6. Creating Spreadsheet Charts and Diagrams
7. Working with Spreadsheet Templates and File Formats
8. Using Spreadsheets' Database Capabilities
9. Building and Maintaining a Relational Database
10. Creating Databases and Tables
11. Sorting, Filtering, and Querying a Database
12. Creating Database Forms and Reports
13. Enhancing Presentations with Graphic Elements and Techniques
14. Creating Presentations for the Web
15. Integrating Applications

EVALUATION:

Evaluation instruments will include written and/or skills-based examinations and individual in-class and/or take-home assignments. Evaluation methods may also include group in-class and/or take-home assignments.

UNITS**Unit 1 Working on a Group Project****General Outcome**

- 1.0 The student shall: be able to work on a Group Project

Specific Learning Outcomes

- 1.1 Review and Modify Document Properties
- 1.2 Use Comments in a Document
- 1.3 Track Changes in a Document
- 1.4 Circulate Documents for Review
- 1.5 Compare and Merge Documents

Unit 2 Document Formats, Columns, Charts, Special Effects, and Styles**General Outcome**

- 2.0 The student shall: be able to use Document Formats, Columns, Charts, Special Effects, and Styles

Specific Learning Outcomes

- 2.1 Create a Document Using a Template
- 2.2 Create an Outline
- 2.3 Create a Multi Column Document
- 2.4 Create a Chart from a Word Table
- 2.5 Format a Chart
- 2.6 Add Special Text Effects
- 2.7 Use existing Styles
- 2.8 Create and Modify New Styles

Unit 3 Working with Tables, Graphics, and Objects**General Outcome**

- 3.0 The student shall: be able to Work with Tables, Graphics, and Objects

Specific Learning Outcomes

- 3.1 Create and Apply a Custom Table Style
- 3.2 Modify Table Properties
- 3.3 Draw a Complex Table
- 3.4 Insert Objects in a Table
- 3.5 Modify an Image

Unit 4 Mail Merge and Automating Mass Mailings**General Outcome**

- 4.0 The student shall: be able to use Mail Merge and Automating Mass Mailings

Specific Learning Outcomes

- 4.1 Create Labels Using the Mail Merge Wizard

- 4.2 Create a Form Letter
- 4.3 Merge Letters with Records from the Data Source

Unit 5 Advanced Spreadsheet Functions**General Outcome**

- 5.0 The student shall: be able to use Advanced Spreadsheet Functions

Specific Learning Outcomes

- 5.1 Create Range Names
- 5.2 Use Range Names in a Formula
- 5.3 Create Statistical Functions
- 5.4 Create Date and Time Functions
- 5.5 Create Financial and Logical Functions

Unit 6 Creating Spreadsheet Charts and Diagrams**General Outcome**

- 6.0 The student shall: be able to Create Spreadsheet Charts and Diagrams

Specific Learning Outcomes

- 6.1 Create and Modify a Column Chart
- 6.2 Create and Modify a Line Chart
- 6.3 Create and Modify a Pie Chart
- 6.4 Print Charts
- 6.5 Create a Diagram
- 6.6 Organize and Format Worksheets

Unit 7 Working with Spreadsheet Templates and File Formats**General Outcome**

- 7.0 The student shall: be able to Work with Spreadsheet Templates and File Formats

Specific Learning Outcomes

- 7.1 Use Excel Templates
- 7.2 Enhance a Worksheet with AutoFormats and Styles
- 7.3 Prepare a Worksheet to Share with Others
- 7.4 Use Drawing Tools
- 7.5 Use the Research Feature

Unit 8 Using Spreadsheets' Database Capabilities**General Outcome**

- 8.0 The student shall: be able to Use Spreadsheets' Database Capabilities

Specific Learning Outcomes

- 8.1 Import Data into Excel
- 8.2 Sort Data
- 8.3 Manage Data Using a Data Form

- 8.4 Use AutoFilter
- 8.5 Analyze Data with Excel Database Tools
- 8.6 Use Database Functions

Unit 9 Building and Maintaining a Relational Database**General Outcome**

- 9.0 The student shall: be able to Build and Maintain a Relational Database

Specific Learning Outcomes

- 9.1 View Relationships in a Database
- 9.2 Establish Relationships between Tables
- 9.3 Identify and Correct Design Errors in Tables
- 9.4 Create a Query from Joined Tables
- 9.5 Protect and Maintain a Database

Unit 10 Creating Databases and Tables**General Outcome**

- 10.0 The student shall: be able to Create Databases and Tables

Specific Learning Outcomes

- 10.1 Create a New Database
- 10.2 Create a New Table
- 10.3 Add Records to a Table
- 10.4 Find and Edit Records in a Table
- 10.5 Modify the Table Design
- 10.6 Create Table Relationships

Unit 11 Sorting, Filtering, and Querying a Database**General Outcome**

- 11.0 The student shall: be able to Sort, Filter, and Query a Database

Specific Learning Outcomes

- 11.1 Sort Records
- 11.2 Filter Records
- 11.3 Create a Select Query
- 11.4 Edit an Existing Query
- 11.5 Sort Data in a Query
- 11.6 Specify Criteria in a Query
- 11.7 Use Compound Criteria

Unit 12 Creating Database Forms and Reports**General Outcome**

- 12.0 The student shall: be able to Create Database Forms and Reports

Specific Learning Outcomes

- 12.1 Create an Auto Form
- 12.2 Use a Form to Add and Delete Records
- 12.3 Create a Form using the Form Wizard
- 12.4 Modify a Form
- 12.5 Create an Auto Report
- 12.6 Create a Report Using the Report Wizard
- 12.7 Modify the Design of a Report
- 12.8 Print a Report

Unit 13 Enhancing Presentations with Graphic Elements and Techniques

General Outcome

- 13.0 The student shall: be able to Enhance Presentations with Graphic Elements and Techniques

Specific Learning Outcomes

- 13.1 Draw and Format Lines
- 13.2 Create Basic Shapes and Text Boxes
- 13.3 Edit Format Drawing Objects
- 13.4 Create and Format Word Art
- 13.5 Insert Images
- 13.6 Enhance Objects with Visual Effects
- 13.7 Apply Custom Animation
- 13.8 Create Motion Paths

Unit 14 Creating Presentations for the Web

General Outcome

- 14.0 The student shall: be able to Create Presentations for the Web

Specific Learning Outcomes

- 14.1 Create a Design Template
- 14.2 Enhance Presentations with Sound
- 14.3 Modify Presentations Using Research and Comparison Tools
- 14.4 Share Files with Other Users
- 14.5 Format a Presentation for the Web

Unit 15 Integrating Applications

General Outcome

- 15.0 The student shall: be able to Integrate Applications

Specific Learning Outcomes

- 15.1 Import Data from Excel to Access
- 15.2 Link an Access Form to an Excel Worksheet
- 15.3 Add an Excel Chart to a Power Point Presentation
- 15.4 Add an Excel Chart to an Access Form and Access Report

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BROWARD COLLEGE COURSE OUTLINE

Last Review: 03/12/2015

Next Review: 08/01/2019

COURSE TITLE: COMPUTER APPLICATIONS

COMMON COURSE NUMBER: CGS2100C

EFFECTIVE TERM: Fall 2015

CREDIT HOURS: 3

CONTACT HOUR BREAKDOWN

(per 16 week term)

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- 10.5 Modify the Table Design
- 10.6 Create Table Relationships

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Specific Learning Outcomes

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- 11.5 Sort Data in a Query
- 11.6 Specify Criteria in a Query
- 11.7 Use Compound Criteria

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- 12.4 Modify a Form
- 12.5 Create an Auto Report
- 12.6 Create a Report Using the Report Wizard
- 12.7 Modify the Design of a Report
- 12.8 Print a Report

Unit 13 Enhancing Presentations with Graphic Elements and Techniques

General Outcome

- 13.0 The student shall: be able to Enhance Presentations with Graphic Elements and Techniques

Specific Learning Outcomes

- 13.1 Draw and Format Lines
- 13.2 Create Basic Shapes and Text Boxes
- 13.3 Edit Format Drawing Objects
- 13.4 Create and Format Word Art
- 13.5 Insert Images
- 13.6 Enhance Objects with Visual Effects
- 13.7 Apply Custom Animation
- 13.8 Create Motion Paths

Unit 14 Creating Presentations for the Web

General Outcome

- 14.0 The student shall: be able to Create Presentations for the Web

Specific Learning Outcomes

- 14.1 Create a Design Template
- 14.2 Enhance Presentations with Sound
- 14.3 Modify Presentations Using Research and Comparison Tools
- 14.4 Share Files with Other Users
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Unit 15 Integrating Applications

General Outcome

- 15.0 The student shall: be able to Integrate Applications

Specific Learning Outcomes

- 15.1 Import Data from Excel to Access
- 15.2 Link an Access Form to an Excel Worksheet
- 15.3 Add an Excel Chart to a Power Point Presentation
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BROWARD COLLEGE COURSE OUTLINE

Last Review: 03/09/2016

Next Review: 08/01/2020

COURSE TITLE: A+ PRACTICAL

COMMON COURSE NUMBER: CTS2131C

EFFECTIVE TERM: Fall 2016

CREDIT HOURS: 3

CONTACT HOUR BREAKDOWN

(per 16 week term)

Lecture: 32

Lab: 16

Clinic:

Other:

College Placement Testing Requirements

N/A

Prerequisite

CTS1133C with a minimum grade of C

Corequisite

None

Pre/Corequisite

None

COURSE DESCRIPTION: This course provides students with the skills required to install, configure, upgrade, and maintain PC workstations, the Windows OS and SOHO networks, in addition the student will be able to utilize troubleshooting techniques and tools to effectively and efficiently resolve PC, OS, and network connectivity issues and implement security practices.

UNIT TITLES

1. Operating Systems
2. Security
3. Mobile Devices
4. Troubleshooting

EVALUATION:

Evaluation instruments will include written and/or skills-based examination and individual in-class and/or take-home assignments. Evaluation methods may also include group in-class and/or take-home assignments.

UNITS**Unit 1 Operating Systems**General Outcome

- 1.0 The student will be able to support various of operating systems.

Specific Learning Outcomes

- 1.1 Compare and contrast the features and requirements of various Microsoft Operating Systems.
- Windows XP Home, Windows XP Professional, Windows XP Media Center, Windows XP 64-bit Professional
 - Windows Vista Home Basic, Windows Vista Home Premium, Windows Vista Business, Windows Vista Ultimate, Windows Vista Enterprise

- Windows 7 Starter, Windows 7 Home Premium, Windows 7 Professional, Windows 7 Ultimate, Windows 7 Enterprise
- Features:
 - 32-bit vs. 64-bit
 - Aero, gadgets, user account control, bit-locker, shadow copy, system restore, ready boost, sidebar, compatibility mode, XP mode, easy transfer, administrative tools, defender, Windows firewall, security center, event viewer, file structure and paths, category view vs. classic view
- Upgrade paths – differences between in place upgrades, compatibility tools, Windows upgrade OS advisor

1.2 Given a scenario, install, and configure the operating system using the most appropriate method.

- Boot methods
 - USB
 - CD-ROM
 - DVD
 - PXE
- Type of installations
 - Creating image
 - Unattended installation
 - Upgrade
 - Clean install
 - Repair installation
 - Multiboot
 - Remote network installation
 - Image deployment
- Partitioning
 - Dynamic
 - Basic
 - Primary
 - Extended
 - Logical
- File system types/formatting
 - FAT
 - FAT32
 - NTFS
 - CDFS
 - Quick format vs. full format
- Load alternate third party drivers when necessary
- Workgroup vs. Domain setup
- Time/date/region/language settings
- Driver installation, software and windows updates
- Factory recovery partition

1.3 Given a scenario, use appropriate command line tools.

- Networking
 - PING
 - TRACERT
 - NETSTAT
 - IPCONFIG
 - NET
 - NSLOOKUP
 - NBTSTAT
- OS

- TASKKILL
- BOOTREC
- SHUTDOWN
- TASKLIST
- MD
- RD
- CD
- DEL
- FDISK
- FORMAT
- COPY
- XCOPY
- ROBOCOPY
- DISKPART
- SFC
- CHKDSK
- [command name] /?
- Recovery console
 - Fixboot
 - Fixmbr

1.4 Given a scenario, use appropriate operating system features and tools.

- Administrative
 - Computer management
 - Device manager
 - Users and groups
 - Local security policy
 - Performance monitor
 - Services
 - System configuration
 - Task scheduler
 - Component services
 - Data sources
 - Print management
 - Windows memory diagnostics
 - Windows firewall
 - Advanced security
- MSCONFIG
 - General
 - Boot
 - Services
 - Startup
 - Tools
- Task Manager
 - Applications
 - Processes
 - Performance
 - Networking
 - Users
- Disk management
 - Drive status
 - Mounting
 - Extending partitions
 - Splitting partitions
 - Assigning drive letters

- Adding drives
- Adding arrays
- Other
 - User State Migration tool (USMT), File and Settings Transfer Wizard, Windows Easy Transfer
- Run line utilities
 - MSCONFIG
 - REGEDIT
 - CMD
 - SERVICES.MSC
 - MMC
 - MSTSC
 - NOTEPAD
 - EXPLORER
 - MSINFO32
 - DXDIAG

1.5 Given a scenario, use Control Panel utilities (the items are organized by “classic view/large icons” in Windows).

- Common to all Microsoft Operating Systems
 - Internet options
 - Connections
 - Security
 - General
 - Privacy
 - Programs
 - Advanced
 - Display/Display Settings
 - Resolution
 - User accounts
 - Folder options
 - View hidden files
 - Hide extensions
 - General options
 - View options
 - System
 - Performance (virtual memory)
 - Remote settings
 - System protection
 - Windows firewall
 - Power options
 - Hibernate
 - Power plans
 - Sleep/suspend
 - Standby
- Unique to Windows XP
 - Add/remove programs
 - Network connections
 - Printers and faxes
 - Automatic updates
 - Network setup wizard
- Unique to Vista
 - Tablet PC settings
 - Pen and input devices
 - Offline files

- Problem reports and solutions
- Printers
- Unique to Windows 7
 - HomeGroup
 - Action Center
 - Security Center
 - Remote Applications and Desktop Connections
 - Troubleshooting

1.6 Setup and configure Windows networking on a client/desktop.

- HomeGroup, file/print sharing
- WorkGroup vs. domain setup
- Network shares/mapping drives
- Establish networking connections
 - VPN
 - Dialups
 - Wireless
 - Wired
 - WWAN (Cellular)
- Proxy settings
- Remote desktop
- Home vs. Work vs. Public network settings
- Firewall settings
 - Exceptions
 - Configuration
 - Enabling/disabling Windows firewall
- Configuring an alternative IP address in Windows
 - IP addressing
 - Subnet mask
 - DNS
 - Gateway
- Network card properties
 - Half duplex/full duplex/auto
 - Speed
 - Wake-on-LAN
 - QoS

1.7 Perform preventive maintenance procedures using appropriate tools.

- Best practices
 - Schedules backups
 - Scheduled check disks
 - Scheduled defragmentation
 - Windows updates
 - Patch management
 - Driver/firmware updates
 - Antivirus updates
- Tools
 - Backup
 - System restore
 - Check disk
 - Recovery image
 - Defrag

1.8 Explain the differences among basic OS security settings.

- User and groups
 - Administrator
 - Power user
 - Guest
 - Standard user
- NTFS vs. Share permissions
 - Allow vs. deny
 - Moving vs. copying folders and files
 - File attributes
- Shared files and folders
 - Administrative shares vs. local shares
 - Permission propagation
 - Inheritance
- System files and folders
- User authentication
 - Single sign-on

1.9 Explain the basics of client-side virtualization.

- Purpose of virtual machines
- Resource requirements
- Emulator requirements
- Security requirements
- Network requirements
- Hypervisor

Unit 2 SecurityGeneral Outcome

2.0 The student will be able to implement common security methods.

Specific Learning Outcomes

2.1 Apply and use common prevention methods.

- Physical security
 - Lock doors
 - Tailgating
 - Securing physical documents/passwords/shredding
 - Biometrics
 - Badges
 - Key fobs
 - RFID badge
 - RSA token
 - Privacy filters
 - Retinal
- Digital security
 - Antivirus
 - Firewalls
 - Antispyware
 - User authentication/strong passwords
 - Directory permissions
- User education
- Principle of least privilege

- 2.2 Compare and contrast common security threats.
- Social engineering
 - Malware
 - Rootkits
 - Phishing
 - Shoulder surfing
 - Spyware
 - Viruses
 - Worms
 - Trojans
- 2.3 Implement security best practices to secure a workstation.
- Setting strong passwords
 - Requiring passwords
 - Restricting user permissions
 - Changing default user names
 - Disabling guest account
 - Screensaver required password
 - Disable autorun
- 2.4 Given a scenario, use the appropriate data destruction/disposal method.
- Low level format vs. standard format
 - Hard drive sanitation and sanitation methods
 - Overwrite
 - Drive wipe
 - Physical destruction
 - Shredder
 - Drill
 - Electromagnetic
 - Degaussing tool
- 2.5 Given a scenario, secure a SOHO wireless network.
- Change default user-names and passwords
 - Changing SSID
 - Setting encryption
 - Disabling SSID broadcast
 - Enable MAC filtering
 - Antenna and access point placement
 - Radio power levels
 - Assign static IP addresses
- 2.6 Given a scenario, secure a SOHO wired network.
- Change default usernames and passwords
 - Enable MAC filtering
 - Assign static IP addresses
 - Disabling ports
 - Physical security

Unit 3 Mobile Devices

General Outcome

- 3.0 The student will be able to support mobile devices.

Specific Learning Outcomes

- 3.1 Explain the basic features of mobile operating systems.
- Android 4.0.x vs. iOS 5.x
 - Open source vs. closed source/vendor specific
 - App source (app store and market)
 - Screen orientation (accelerometer/gyroscope)
 - Screen calibration
 - GPS and geotracking
- 3.2 Establish basic network connectivity and configure email.
- Wireless / cellular data network (enable/disable)
 - Bluetooth
 - Enable Bluetooth
 - Enable pairing
 - Find device for pairing
 - Enter appropriate pin code
 - Test connectivity
 - Email configuration
 - Server address
 - POP3
 - IMAP
 - Port and SSL settings
 - Exchange
 - Gmail
- 3.3 Compare and contrast methods for securing mobile devices.
- Passcode locks
 - Remote wipes
 - Locator applications
 - Remote backup applications
 - Failed login attempts restrictions
 - Antivirus
 - Patching/OS updates
- 3.4 Compare and contrast hardware differences in regards to tablets and laptops.
- No field serviceable parts
 - Typically not upgradeable
 - Touch interface
 - Touch flow
 - Multitouch
 - Solid state drives
- 3.5 Execute and configure mobile device synchronization.
- Types of data to synchronize
 - Contacts
 - Programs
 - Email
 - Pictures
 - Music
 - Videos
 - Software requirements to install the application on the PC
 - Connection types to enable synchronization

Unit 4 Troubleshooting
General Outcome

4.0 The students will be able to troubleshoot technology issues.

Specific Learning Outcomes

4.1 Given a scenario, explain the troubleshooting theory.

- Identify the problem
 - Question the user and identify user changes to computer and perform backups before making changes
- Establish a theory of probable cause (question the obvious)
- Test the theory to determine cause
 - Once theory is confirmed determine next steps to resolve problem
 - If theory is not confirmed re-establish new theory or escalate
- Establish a plan of action to resolve the problem and implement the solution
- Verify full system functionality and if applicable implement preventive measures
- Document findings, actions and outcomes

4.2 Given a scenario, troubleshoot common problems related to motherboards, RAM, CPU and power with appropriate tools.

- Common symptoms
 - Unexpected shutdowns
 - System lockups
 - POST code beeps
 - Blank screen on bootup
 - BIOS time and settings resets
 - Attempts to boot to incorrect device
 - Continuous reboots
 - No power
 - Overheating
 - Loud noise
 - Intermittent device failure
 - Fans spin – no power to other devices
 - Indicator lights
 - Smoke
 - Burning smell
 - BSOD
- Tools
 - Multimeter
 - Power supply tester
 - Loopback plugs
 - POST card

4.3 Given a scenario, troubleshoot hard drives and RAID arrays with appropriate tools.

- Common symptoms
 - Read/write failure
 - Slow performance
 - Loud clicking noise
 - Failure to boot
 - Drive not recognized
 - OS not found
 - RAID not found
 - RAID stops working
 - BSOD
- Tools
 - Screwdriver
 - External enclosures

- CHKDSK
 - FORMAT
 - FDISK
 - File recovery software
- 4.4 Given a scenario, troubleshoot common video and display issues.
- Common symptoms
 - VGA mode
 - No image on screen
 - Overheat shutdown
 - Dead pixels
 - Artifacts
 - Color patterns incorrect
 - Dim image
 - Flickering image
 - Distorted image
 - Discoloration (degaussing)
 - BSOD
- 4.5 Given a scenario, troubleshoot wired and wireless networks with appropriate tools.
- Common symptoms
 - No connectivity
 - APIPA address
 - Limited connectivity
 - Local connectivity
 - Intermittent connectivity
 - IP conflict
 - Slow transfer speeds
 - Low RF signal
 - Tools
 - Cable tester
 - Loopback plug
 - Punch down tools
 - Toner probes
 - Wire strippers
 - Crimper
 - PING
 - IPCONFIG
 - TRACERT
 - NETSTAT
 - NBTSTAT
 - NET
 - Wireless locator
- 4.6 Given a scenario, troubleshoot operating system problems with appropriate tools.
- Common symptoms
 - BSOD
 - Failure to boot
 - Improper shutdown
 - Spontaneous shutdown/restart
 - RAID not detected during installation
 - Device fails to start
 - Missing dll message
 - Services fails to start
 - Compatibility error

- Slow system performance\
- Boots to safe mode
- File fails to open
- Missing NTLDR
- Missing Boot.ini
- Missing operating system
- Missing Graphical Interface
- Graphical Interface fails to load
- Invalid boot disk
- Tools
 - Fixboot
 - Recovery console
 - Fixmbr
 - Sfc
 - Repair disks
 - Pre-installation environments
 - MSCONFIG
 - DEFRAG
 - REGSRV32
 - REGEDIT
 - Event viewer
 - Safe mode
 - Command prompt
 - Emergency repair disk
 - Automated system recovery

4.7 Given a scenario, troubleshoot common security issues with appropriate tools and best practices.

- Common symptoms
 - Pop-ups
 - Browser redirection
 - Security alerts
 - Slow performance
 - Internet connectivity issues
 - PC locks up
 - Windows updates failures
 - Rogue antivirus
 - Spam
 - Renamed system files
 - Files disappearing
 - File permission changes
 - Hijacked email
 - Access denied
- Tools
 - Anti-virus software
 - Anti-malware software
 - Anti-spyware software
 - Recovery console
 - System restore
 - Pre-installation environments
 - Event viewer
- Best practices for malware removal
 - Identify malware symptoms
 - Quarantine infected system
 - Disable system restore

- Remediate infected systems
 - Update anti-virus software
 - Scan and removal techniques (safe mode, pre-installation environment)
 - Schedule scans and updates
 - Enable system restore and create restore point
 - Educate end user
- 4.8 Given a scenario, troubleshoot, and repair common laptop issues while adhering to the appropriate procedures.

- Common symptoms
 - No display
 - Dim display
 - Flickering display
 - Sticking keys
 - Intermittent wireless
 - Battery not charging
 - Ghost cursor
 - No power
 - Num lock indicator lights
 - No wireless connectivity
 - No Bluetooth connectivity
 - Cannot display to external monitor
- Disassembling processes for proper re-assembly
 - Document and label cable and screw locations
 - Organize parts
 - Refer to manufacturer documentation
 - Use appropriate hand tools

- 4.9 Given a scenario, troubleshoot printers with appropriate tools

- Common symptoms
 - Streaks
 - Faded prints
 - Ghost images
 - Toner not fused to the paper
 - Creased paper
 - Paper not feeding
 - Paper jam
 - No connectivity
 - Garbled characters on paper
 - Vertical lines on page
 - Backed up print queue
 - Low memory errors
 - Access denied
 - Printer will not print
 - Color prints in wrong print color
 - Unable to install printer
 - Error codes
- Tools
 - Maintenance kit
 - Toner vacuum
 - Compressed air
 - Printer spooler

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BROWARD COLLEGE COURSE OUTLINE

Last Review: 03/09/2016

Next Review: 08/01/2020

COURSE TITLE: A+ ESSENTIALS

COMMON COURSE NUMBER: CTS1133C

EFFECTIVE TERM: Fall 2016

CREDIT HOURS: 3

CONTACT HOUR BREAKDOWN

(per 16 week term)

Lecture: 32

Lab: 16

Clinic:

Other:

College Placement Testing Requirements

N/A

Prerequisite

None

Corequisite

None

Pre/Corequisite

None

COURSE DESCRIPTION: This course provides students with the knowledge required to assemble components based on customer requirements, install, configure and maintain devices, PCs and software for end users, understand the basics of networking and security/forensics, properly and safely diagnose, resolve and document common hardware and software issues while applying troubleshooting skills. Successful candidates will also provide appropriate customer support; understand the basics of virtualization, desktop imaging, and deployment.

UNIT TITLES

1. PC Hardware
2. Networking
3. Laptops
4. Printers
5. Operational Procedures

EVALUATION:

Evaluation instruments will include written and/or skills-based examination and individual in-class and/or take-home assignments. Evaluation methods may also include group in-class and/or take-home assignments.

UNITS**Unit 1****PC Hardware**General Outcome

- 1.0 The students will be able to work on PC Hardware.

Specific Learning Outcomes

- 1.1 Configure and apply BIOS settings.
 - Install firmware upgrades – flash BIOS
 - BIOS component information
 - RAM
 - Hard drive
 - Optical drive
 - CPU
 - BIOS configurations
 - Boot sequence
 - Enabling and disabling devices
 - Date/time
 - Clock speeds
 - Virtualization support
 - BIOS security (passwords, drive encryption: TPM, lo-jack)
 - Use built-in diagnostics
 - Monitoring
 - Temperature monitoring
 - Fan speeds
 - Intrusion detection/notification
 - Voltage
 - Clock
 - Bus speed
- 1.2 Differentiate between motherboard components, their purposes, and properties.
 - Sizes
 - ATX
 - Micro-ATX
 - ITX
 - Expansion slots
 - PCI
 - PCI-X
 - PCIe
 - miniPCI
 - CNR
 - AGP2x, 4x, 8x
 - RAM slots
 - CPU sockets
 - Chipsets
 - North Bridge
 - South Bridge
 - CMOS battery
 - Jumpers
 - Power connections and types
 - Fan connectors
 - Front panel connectors
 - USB
 - Audio
 - Power button
 - Power light
 - Drive activity lights
 - Reset button
 - Bus speeds

- 1.3 Compare and contrast RAM types and features.
 - Types
 - DDR
 - DDR2
 - DDR3
 - SDRAM
 - SODIMM
 - RAMBUS
 - DIMM
 - Parity vs. non-parity
 - ECC vs. non-ECC
 - RAM configurations
 - Single channel vs. dual channel vs. triple channel
 - Single sided vs. double sided
 - RAM compatibility and speed
- 1.4 Install and configure expansion cards.
 - Sound cards
 - Video cards
 - Network cards
 - Serial and parallel cards
 - USB cards
 - Firewire cards
 - Storage cards
 - Modem cards
 - Wireless/cellular cards
 - TV tuner cards
 - Video capture cards
 - Riser cards
- 1.5 Install and configure storage devices and use appropriate media.
 - Optical drives
 - CD-ROM
 - DVD-ROM
 - Blu-Ray
 - Combo drives and burners
 - CD-RW
 - DVD-RW
 - Dual Layer DVD-RW
 - BD-R
 - BD-RE
 - Connection types
 - External
 - USB
 - Firewire
 - eSATA
 - Ethernet
 - Internal SATA, IDE and SCSI
 - IDE configuration and setup (Master, Slave, Cable Select)
 - SCSI IDs (0 – 15)
 - Hot swappable drives
 - Hard drives
 - Magnetic
 - 5400 rpm
 - 7200 rpm

- 10,000 rpm
- 15,000 rpm
- Solid state/flash drives
 - Compact flash
 - SD
 - Micro-SD
 - Mini-SD
 - xD
 - SSD
- RAID types
 - 0
 - 1
 - 5
 - 10
- Floppy drive
- Tape drive
- Media capacity
 - CD
 - CD-RW
 - DVD-RW
 - DVD
 - Blu-Ray
 - Tape
 - Floppy
 - DVD DL

1.6 Differentiate among various CPU types and features and select the appropriate cooling method.

- Socket types
 - Intel: LGA, 775, 1155, 1156, 1366
 - AMD: 940, AM2, AM2+, AM3, AM3+, FM1, F
- Characteristics
 - Speeds
 - Cores
 - Cache size/type
 - Hyperthreading
 - Virtualization support
 - Architecture (32-bit vs. 64-bit)
 - Integrated GPU
- Cooling
 - Heat sink
 - Fans
 - Thermal paste
 - Liquid-based

1.7 Compare and contrast various connection interfaces and explain their purpose.

- Physical connections
 - USB 1.1 vs. 2.0 vs. 3.0 speed and distance characteristics
- Connector types: A, B, mini, micro
 - Firewire 400 vs. Firewire 800 speed and distance characteristics
 - SATA1 vs. SATA2 vs. SATA3, eSATA, IDE speeds
 - Other connector types
- Serial
- Parallel
- VGA

- HDMI
 - DVI
 - Audio
 - RJ-45
 - RJ-11
 - Analog vs. digital transmission
 - VGA vs. HDMI
 - Speeds, distances and frequencies of wireless device connections
 - Bluetooth
 - IR
 - RF
- 1.8 Install an appropriate power supply based on a given scenario.
- Connector types and their voltages
 - SATA
 - Molex
 - 4/8-pin 12v
 - PCIe 6/8-pin
 - 20-pin
 - 24-pin
 - Floppy
 - Specifications
 - Wattage
 - Size
 - Number of connectors
 - ATX
 - Micro-ATX
 - Dual voltage options
- 1.9 Evaluate and select appropriate components for a custom configuration, to meet customer specifications or needs.
- Graphic / CAD / CAM design workstation
 - Powerful processor
 - High-end video
 - Maximum RAM
 - Audio/Video editing workstation
 - Specialized audio and video card
 - Large fast hard drive
 - Dual monitors
 - Virtualization workstation
 - Maximum RAM and CPU cores
 - Gaming PC
 - Powerful processor
 - High-end video/specialized GPU
 - Better sound card
 - High-end cooling
 - Home Theater PC
 - Surround sound audio
 - HDMI output
 - HTPC compact form factor
 - TV tuner
 - Standard thick client
 - Desktop applications
 - Meets recommended requirements for running Windows
 - Thin client

- Basic applications
- Meets minimum requirements for running Windows
- Home Server PC
 - Media streaming
 - File sharing
 - Print sharing
 - Gigabit NIC
 - RAID array

1.10 Given a scenario, evaluate types and features of display devices.

- Types
 - CRT
 - LCD
 - LED
 - Plasma
 - Projector
 - OLED
- Refresh rates
- Resolution
- Native resolution
- Brightness/lumens
- Analog vs. digital
- Privacy/antiglare filters
- Multiple displays

1.11 Identify connector types and associated cables.

- Display connector types
 - DVI-D
 - DVI-I
 - DVI-A
 - DisplayPort
 - RCA
 - HD15 (i.e. DE15 or DB15)
 - BNC
 - miniHDMI
 - RJ-45
 - miniDin-6
- Display cable types
 - HDMI
 - DVI
 - VGA
 - Component
 - Composite
 - S-video
 - RGB
 - Coaxial
 - Ethernet
- Device connectors and pin arrangements
 - SATA
 - eSATA
 - PATA
 - IDE
 - EIDE
 - Floppy
 - USB

- IEEE1394
- SCSI
- PS/2
- Parallel
- Serial
- Audio
- RJ-45
- Device cable types
 - SATA
 - eSATA
 - IDE
 - EIDE
 - Floppy
 - USB
 - IEEE1394
 - SCSI
 - 68pin vs. 50pin vs. 25pin
 - Parallel
 - Serial
 - Ethernet
 - Phone

1.12 Install and configure various peripheral devices.

- Input devices
 - Mouse
 - Keyboard
 - Touch screen
 - Scanner
 - Barcode reader
 - KVM
 - Microphone
 - Biometric devices
 - Game pads
 - Joysticks
 - Digitizer
- Multimedia devices
 - Digital cameras
 - Microphone
 - Webcam
 - Camcorder
 - MIDI enabled devices
- Output devices
 - Printers
 - Speakers
 - Display devices

Unit 2 **Networking**

General Outcome

2.0 The students will have a basic understanding of the network.

Specific Learning Outcomes

- 2.1 Identify types of network cables and connectors.
 - Fiber
 - Connectors: SC, ST, LC
 - Twisted Pair
 - Connectors: RJ-11, RJ-45
 - Wiring standards: T568A, T568B
 - Coaxial
 - Connectors: BNC, F-connector
- 2.2 Categorize characteristics of connectors and cabling.
 - Fiber
 - Types (single-mode vs. multi-mode)
 - Speed and transmission limitations
 - Twisted pair
 - Types: STP, UTP, CAT3, CAT5, CAT5e, CAT6, plenum, PVC
 - Speed and transmission limitations
 - Coaxial
 - Types: RG-6, RG-59
 - Speed and transmission limitations
- 2.3 Explain properties and characteristics of TCP/IP.
 - IP class
 - Class A
 - Class B
 - Class C
 - IPv4 vs. IPv6
 - Public vs. private vs. APIPA
 - Static vs. dynamic
 - Client-side DNS
 - DHCP
 - Subnet mask
 - Gateway
- 2.4 Explain common TCP and UDP ports, protocols, and their purpose.
 - Ports
 - 21 – FTP
 - 23 – TELNET
 - 25 – SMTP
 - 53 – DNS
 - 80 – HTTP
 - 110 – POP3
 - 143 – IMAP
 - 443 – HTTPS
 - 3389 – RDP
 - Protocols
 - DHCP
 - DNS
 - LDAP
 - SNMP
 - SMB
 - CIFS
 - SSH
 - SFTP
 - TCP vs. UDP

- 2.5 Compare and contrast wireless networking standards and encryption types.
- Standards
 - 802.11 a/b/g/n
 - Speeds, distances and frequencies
 - Encryption types
 - WEP, WPA, WPA2, TKIP, AES
- 2.6 Install, configure, and deploy a SOHO wireless/wired router using appropriate settings.
- MAC filtering
 - Channels (1 – 11)
 - Port forwarding, port triggering
 - SSID broadcast (on/off)
 - Wireless encryption
 - Firewall
 - DHCP (on/off)
 - DMZ
 - NAT
 - WPS
 - Basic QoS
- 2.7 Compare and contrast Internet connection types and features.
- Cable
 - DSL
 - Dial-up
 - Fiber
 - Satellite
 - ISDN
 - Cellular (mobile hotspot)
 - Line of sight wireless internet service
 - WiMAX
- 2.8 Identify various types of networks.
- LAN
 - WAN
 - PAN
 - MAN
 - Topologies
 - Mesh
 - Ring
 - Bus
 - Star
 - Hybrid
- 2.9 Compare and contrast network devices, their functions, and features.
- Hub
 - Switch
 - PoE
 - Router
 - Access point
 - Bridge
 - Modem
 - NAS
 - Firewall
 - VoIP phones
 - Internet appliance

2.10 Given a scenario, use appropriate networking tools.

- Crimper
- Multimeter
- Toner probe
- Cable tester
- Loopback plug
- Punchdown tool

Unit 3 Laptops

General Outcome

3.0 The students will be able to work on laptops

Specific Learning Outcomes

3.1 Install and configure laptop hardware and components.

- Expansion options
 - Express card /34
 - Express card /54
 - PCMCIA
 - SODIMM
 - Flash
- Hardware/device replacemento
 - Keyboard
 - Hard Drive (2.5 vs. 3.5)
 - Memory
 - Optical drive
 - Wireless card
 - Mini-PCIe
 - Screen
 - DC jack
 - Battery
 - TouchpadPlastics
 - Speaker
 - System board
 - CPU

3.2 Compare and contrast the components within the display of a laptop.

- Types
 - LCD
 - LED
 - OLED
 - Plasma
- Wi-Fi antenna connector/placement
- Inverter and its function
- Backlight

3.3 Compare and contrast laptop features.

- Special function keys
 - Dual displays
 - Wireless (on/off)
 - Volume settings
 - Screen brightness
 - Bluetooth (on/off)
 - Keyboard backlight

- Docking station vs. port replicator
- Physical laptop lock and cable lock

Unit 4 Printers

General Outcome

4.0 The students will be able to configure and maintain printers.

Specific Learning Outcomes

- 4.1 Explain the differences between the various printer types and summarize the associated imaging process.
- Laser
 - Imaging drum, fuser assembly, transfer belt, transfer roller, pickup rollers, separate pads, duplexing assembly
 - Imaging process: processing, charging, exposing, developing, transferring, fusing and cleaning
 - Inkjet
 - Ink cartridge, print head, roller, feeder, duplexing assembly, carriage and belt
 - Calibration
 - Thermal
 - Feed assembly, heating element
 - Special thermal paper
 - Impact
 - Print head, ribbon, tractor feed
 - Impact paper
- 4.2 Given a scenario, install, and configure printers.
- Use appropriate printer drivers for a given operating system
 - Print device sharing
 - Wired
 - USB
 - Parallel
 - Serial
 - Ethernet
 - Wireless
 - Bluetooth
 - 802.11x
 - Infrared (IR)
 - Printer hardware print server
 - Printer sharing
 - Sharing local/networked printer via Operating System settings
- 4.3 Given a scenario, perform printer maintenance.
- Laser
 - Replacing toner, applying maintenance kit, calibration, cleaning
 - Thermal
 - Replace paper, clean heating element, remove debris
 - Impact
 - Replace ribbon, replace print head, replace paper

Unit 5 Operational Procedures

General Outcome

5.0 The students will understand operational procedures in a professional environment.

Specific Learning Outcomes

- 5.1 Given a scenario, use appropriate safety procedures.
- ESD straps
 - ESD mats
 - Self-grounding
 - Equipment grounding
 - Personal safety
 - Disconnect power before repairing PC
 - Remove jewelry
 - Lifting techniques
 - Weight limitations
 - Electrical fire safety
 - CRT safety – proper disposal
 - Cable management
 - Compliance with local government regulations
- 5.2 Explain environmental impacts and the purpose of environmental controls.
- MSDS documentation for handling and disposal
 - Temperature, humidity level awareness and proper ventilation
 - Power surges, brownouts, blackouts
 - Battery backup
 - Surge suppressor
 - Protection from airborne particles
 - Enclosures
 - Air filters
 - Dust and debris
 - Compressed air
 - Vacuums
 - Component handling and protection
 - Antistatic bags
 - Compliance to local government regulations
- 5.3 Given a scenario, demonstrate proper communication and professionalism.
- Use proper language – avoid jargon, acronyms, slang when applicable
 - Maintain a positive attitude
 - Listen and do not interrupt the customer
 - Be culturally sensitive
 - Be on time (if late contact the customer)
 - Avoid distractions
 - Personal calls
 - Talking to co-workers while interacting with customers
 - Personal interruptions
 - Dealing with difficult customer or situation
 - Avoid arguing with customers and/or being defensive
 - Do not minimize customer's problems
 - Avoid being judgmental
 - Clarify customer statements (ask open ended questions to narrow the scope of the problem, restate the issue or question to verify understanding)
 - Set and meet expectations/timeline and communicate status with the customer
 - Offer different repair/replacement options if applicable
 - Provide proper documentation on the services provided
 - Follow up with customer/user at a later date to verify satisfaction
 - Deal appropriately with customers confidential materials

- Located on a computer, desktop, printer, etc

5.4 Explain the fundamentals of dealing with prohibited content/activity.

- First response
 - Identify
 - Report through proper channels
 - Data/device preservation
- Use of documentation/documentation changes
- Chain of custody
 - Tracking of evidence/documenting process

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