The Council of Community Colleges of Jamaica

Applied Computer Science
A.Sc. Level
Updated 2021 August

CURRICULUM GUIDE

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Institution	Participants
University of Technology, Jamaica **(Externals)**	Karlene Black Bruce McDonald
Caribbean Maritime University	Kelleen Alicia Johnson-Davis Calene Clarke
Bethlehem Moravian College	Joshua Yegon
Brown's Town Community College	Nyoka English Shanice Brown
Excelsior Community College	Gayle Campbell Joseph Smith Steven Detry Sandra Richards
The Moneague College	Delano Archibald Carlington Harris
Montego Bay Community College	Kevin Strachan Alecia Brown-Mighty Synandre Monteque-Dwyer
Portmore Community College	Paulette Sutherland Latoya Walker-Holness Shaula Edwards-Braham Tanya Sireeta Graham Desmond Grant Andrei Scott Omar Brown
Trench Town Polytechnic College	Richard Gustavus Ssyade Gayle Richard Hudson Andre Jones Kameka Allen
The Council of Community Colleges of Jamaica	Donna Powell Wilson Shanique Walker-Carty Roxanne Bloomfield Venessa Buchanan-Williams Glen Heaven Robin Barrett

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1. Background

Community Colleges are pioneers in developing programmes that are market driven and that are unique in their offerings. It is the view of Community Colleges that it is our fundamental role to respond to today's challenges and create tomorrow's opportunities. The challenges of transforming from a developing economy to an advanced economy, hinges on the application and infusion of Information Communication Technology (ICT) in all aspects of human society. Research suggests a strong linkage between the levels of ICT advancement of a country and growth in per capita GDP (UNCTAD).

This Associate Degree in Applied Computer Science prepares learners to use ICT applications to drive organizational success at the national, regional, and international levels. The Associate of Science Degree in Applied Computer Science was developed with industry and academia participation, advice and with the foregone thoughts in mind. Recommendations from the Association for Computing Machinery (ACM) and the Association for Information Systems (AIS) have been infused into various components of the programme.

The programme is the first two-years of a four (4) year undergraduate course of study with a total of 70 credits, providing two exit points for participants (one at the end of two years and the other at the end of four years). After successfully completing the first two years of the programme, the participant may opt to exit at this stage, in which case an Associate Degree will be awarded. That participant may wish to re-enter the programme through any delivery mode (full-time, part-time, distance) offered by the Community College, and complete the requirements for the Bachelor's Degree in an additional two years. Completion of these upper years may be accessed at any of the colleges offering the programme.

2. Programme Rationale

According to research provided by the Jamaica Labour Market Information System *"Ministry of Labour & Social Security Newsletter Volume 5*", technology is one of the drivers of economies due to the principle of growth rate per capita (GDP) being linearly dependent on technological processes. Technology is a business enabler. Today's companies are dependent on accurate processing of data and supporting technology/services and so they are looking to attract the skills that are necessary to fulfil their needs in this area. Jamaican Community Colleges facilitates this process by supplying skilled workers which ultimately results in substantial social and economic benefits to a country.

The Associate Degree in Applied Computer Science was developed as part of a group of programmes that conformed to Curriculum standards designed by the Association of Caribbean Tertiary Institutions (ACTI). The standards ensure equivalency of content and quality of programmes that are delivered by Caribbean Community Colleges.

The Associate Degree in Applied Computer Science positions graduates to take several career paths. They can be involved in the planning, design, implementation, and management of an organisation's information system; they can create their own employment; and they can also matriculate into a Bachelor's degree programme.

3. Programme Description

The Associate Degree in Applied Computer Science is concerned with the development, systems design and programming skills that will enable graduates to function effectively in a variety of entry-level positions; or to matriculate into a bachelor's degree programme.

The graduate of this programme is equipped to work as a part of a team to design, test, document, implement, and evaluate the performance of an information system. Strong emphasis is placed on developing students' critical thinking and problem-solving skills by providing authentic experiences that allow the application of theory to practice.

A graduate of the program should be able to:

1. work as part of a team to analyse, design, develop, document, and implement computer programming solutions to business needs.
2. communicate, orally and in writing with people from diverse backgrounds.
3. use common software application tools to produce documents/information to fulfil stakeholders' needs.
4. operate ethically and with consideration to data security standards.

4. Programme Goals

This programme is designed to develop the necessary knowledge, skills, competencies, and attitudes to meet the needs of the various stakeholders within the Computer Services Sector. The objectives of this programme are to:

1. inspire and challenge students and prepare them for the future.
2. promote meaningful progression towards high standards in all learning areas.
3. provide knowledge, skills, and attitudes which support future learning.
4. emphasise divergent thinking and outcomes.
5. develop independent thinking skills.
6. develop in students the capacity to learn.
7. allow students to relate theory to practice in authentic settings.
8. prepare students for entry level positions in the software development sector.

5. Matriculation Requirements

The CCCJ acknowledges the following examining bodies:

1. The Caribbean Examination Council - CXC

A **pass** in a subject offered by The Caribbean Examination Council at the CSEC level is defined as follows:

Grades: I and II - up to January 1998.
Grades: I, II and III - as at May 1998.

2. Foundation Concepts in Mathematics I, II and III and Foundation in English Language I and II to be equivalent to CSEC Mathematics and English Language, respectively.
3. **University of Cambridge - GCE O'Level**
   A **pass** in a subject offered by The University of Cambridge at the GCE O'Level is as follows:
   Grades: A, B, C.

4. **Secondary School Certificate- SSC**
   A **pass** in a subject offered by the Ministry of Education at the SSC level is as follows:
   Ranges: IV or V.

Note:

In the event of adjustments to the grade schemes by the respective examining bodies, the new grade schemes are deemed applicable with or without any further action on the part of the CCCJ.

For the Associate Level, applicants must meet both the **Basic Matriculation Requirements** as well as the **Programme Matriculation Requirements**.

The Basic Matriculation Requirements generally specify a minimum of **five (5)** passes in subjects at CSEC, GCE O'Level or SSC including English 'A' or English Language and are applicable to all programmes offered by the CCCJ.

The Programme Matriculation Requirements are specific to the particular programme of study being considered by an applicant. As such, each applicant **MUST** consult the **Programme Matriculation Requirements section of this Curriculum handbook to determine what Programme Entry Requirements might be required for the particular programme. The matriculation formula is therefore:**

(Basic Matriculation Requirements + Programme Matriculation Requirements)

For example:

An applicant seeking entry to the Applied Associate in Computer Science programme must possess:

1. **five (5) CSEC** subjects including **English 'A'**, (Basic Matriculation Requirements).
2. **two (2**) of the five (5) passes must be in Mathematics and a Technical subject (Programme Matriculation Requirements).

Basic Matriculation Requirements

There are **two (2)** methods by which an applicant can meet the Basic Matriculation Requirements; these are classified as Standard forms of matriculation and Alternate forms of matriculation.

1. **Standard forms of matriculation**

An applicant **MUST** have a minimum of **five (5)** passes in subjects at CSEC or GCE O'Level **including** English 'A' (CSEC) **or** English Language (GCE O'Level) and CSEC Mathematics and a Technical subject.

2. **Alternate forms of matriculation**

    1. Equivalent qualification(s) as determined by the CCCJ.
    2. Mature Status as determined by the CCCJ.

6. Target Group

This programme targets any of the following individuals:

- Persons with industry experience seeking certification as programmers or Software Engineers.
- Persons with industry experience who need formal training as programmers or Software Engineers.
- Persons who want to change their career path.
- High school graduates interested in careers in Computer Programming or Software Engineering.

7. Programme Duration

The programme may be offered as follows:

Schedule	Duration	Days Offered
Full-time	Four (4) semesters (2 years)	Weekdays, evenings, and weekends. Flexibility is applied based on preference of target group.
Part-time	Six (6) semesters (3 years or 2 summers	

The CCCJ offers programmes at the Associate and Bachelor's levels using a 2 + 2 concept. Under this 2 + 2 concept, the first two (2) years of the programme are at the Associate level and the final two (2) years are at the Bachelor's level:
The programmes are structured to provide a mixture of:

1. General education courses
2. Support courses
3. Specialized courses
4. One free elective

5. Work experience
6. Community service

8. Programme Review Alignment Summary

Section/ Course Module	Adjustment
Business Systems: Analysis and Design	Course changed to Business Systems: Analysis, Design and Development (New Code).
Computer Programming, I	Units updated.
Introduction to Computer Security	Course outcomes updated. Units II, IV & IX updated. Assessment changed from 25 MCQs & 5 ETQs to 20 MCQs and 4 ETQs.
Networking and Communication Technology	Unit I hours adjusted. Units II, VII, VIII, IX content learner outcomes and content updated. Unit IX is a research Unit and will not be tested in the final examination.
Discrete Mathematics & Algebra	Units IV & V updated. Assessment updated to reflect two (2) internal tests and final examination will be 30 MCQ's (1 mark each) and 4 Structured Questions to choose any 2 (25 marks each).
Elective	Additional elective added to programme re UCJ standards.
Fundamentals of IT	Units updated.
Fundamentals of Computer	Rationale updated. Units I, V, VIII adjusted.
Introduction to Graphics	Unit I updated, Unit II, VI VII & XI removed. All other units updated. Course is now continuous assessment portfolio with final examination. This replaces the course Intro to Graphics and Animation.
Major Project	
Web Development I (Using HTML5, JAVA Script & CSS3)	Credit hours increased from 75 to 105. All units updated.

	Assessment updated. Final practical examination changed
	from 40% to 30%. Mid semester and In-course tests now included in assessment. Texts updated. Name updated and Code changed to CPRG2301. A new code was given (CWEB1205).

9. Programme Structure

Curriculum Courses/Modules	Modules/ Course Codes	Number of Credit	Theory Hours	Lab/ Practical Hours	Pre-requisites
Business Systems: Analysis and Design and Development	CMIS1202	3	30	45	Fundamentals of IT
Communication I	COMM1101	3	45		None
Communication II	COMM102	3	45		Communication I
Computer Organization and Architecture	IARC2001	3	45		
Computer Programming, I (C#-OOP, File Mgt. & DB)	CPRG1205	3	15	90	Introduction to Programming
Database Management	CSYS2404	3	45	-	None
Discrete Mathematics and Algebra	MATH1103	4	60		None
Fundamentals of Data and Algorithm Analysis	IDAA2001	3	45	-	Introduction to Programming
Fundamentals of Information Technology	ITEC1104	3	30	45	None
Introduction to Computer and Network Security	CSYS1102	3	45	-	Fundamentals of Information Technology & Networking and Communication Technology

Introduction to Graphics	IGRA1101	3	15	90	None
Introduction to Management	MGMT1101	3	45		None

Curriculum Courses/Modules	Modules /Course Codes	Number of Credits	Theory Hours	Lab/Practical Hours Practical	Pre-requisites
Introduction to Parallel and Distributed Computing	IPAR2001	3	45	-	Fundamentals of Information Technology
Introduction to Programming	CPRG1201	3	30	45	None
Introduction to Psychology I	PSYC1111	3	45	-	-
Networking and Communication Technology	CSYS1208	3	45	30	None
Probability and Statistics	MATH1206	3	45		CSEC Math or equivalent
Oral Communication	COMM2301	3	45		Communication I & Communication II
Web Development I (HTML, JAVA Script, CSS3)	CWEB1205	3	15	90	None
Work Experience	WOEP1100	3		240	None
Small Business Management	MGMT2405	3	30	45	None
Elective		3			
Total		**70**			

A.Sc. APPLIED COMPUTER SCIENCE (FULL TIME)

YEAR 1

Semester I

CODE	COURSE	CREDITS (HOURS)
COMM1101	Communication I	3 (45)
MATH1103	Discrete Mathematics and Algebra	4 (60)
ITEC1104	Fundamentals of Information Technology	3 (75)
MGMT1101	Introduction to Management	3 (45)
CPRG1201	Introduction to Programming	3 (105)
		16

Semester II

CODE	COURSE	CREDITS (HOURS)
COMM1202	Communication II	3 (45)
CPRG1205	Computer Programming, I (C#OOP& DB)	3 (105)
MATH1206	Probability and Statistics	3 (45)
CWEB1205	Web Development I- Using HTML5, JAVA Script & CSS3	3(105)
	Elective	3
CSYS2404	Database Management	3 (45)
		18

YEAR 2

Semester III

CODE	COURSE	CREDITS (HOURS)
PSYC1111	Introduction to Psychology I	3 (45)
	Introduction to Graphics	3(105)
COMM2301	Oral Communication	3 (45)
IPAR2001	Introduction to Parallel and Distributed Computing	3 (45)
	Elective*	3
CSYS1208	Networking and Communication Technology	3(75)
		18

Semester IV

CODE	COURSE	CREDITS (HOURS)
CMIS1202	Business Systems Analysis, Design and Development	3 (75)
CSYS1102	Introduction to Computer and Network Security	3 (45)
MGMT2405	Small Business Management	3 (75)
IDAA2001	Fundamentals of Data and Algorithms Analysis	3 (45)
WOEP1100	Work Experience	3 (240)
IARC2001	Computer Organization and Architecture	3 (45)
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A.Sc. APPLIED COMPUTER SCIENCE (PART TIME)

YEAR 1

Semester I

CODE	COURSE	CREDITS (HOURS)
COMM1101	Communication I	3
ITEC1104	Fundamentals of Information Technology	3
MATH1103	Discrete Mathematics and Algebra	4
CPRG1201	Introduction to Programming	3
Total		**13**

Semester II

CODE	COURSE	CREDITS (HOURS)
RMTD3401	Communication II	3
CPRG1205	Computer Programming, I (C#OOP & DB)	3
CSYS2404	Database Management	3
MATH1206	Probability and Statistics	3
Total		**12**

Summer I

CODE	COURSE	CREDITS (HOURS)
MGMT1101	Introduction to Management	3
CSYS1102	Introduction to Computer and Network Security	3
CWEB1205	Web Development I - Using HTML5, JAVA Script & CSS3	3
Total		**6**

YEAR 2

Semester III

CODE	COURSE	CREDITS (HOURS)
	Elective	3
IGRA1101	Introduction to Graphics	3
COMM2301	Oral Communication	3
IPAR2001	Introduction to Parallel and Distributed Computing	3
Total		**12**

Semester IV

CODE	COURSE	CREDITS (HOURS)
CSYS1208	Networking and Communication Technology	3
IDAA2001	Fundamentals of Data and Algorithm Analysis	3
IARC2001	Computer Organization and Architecture	3
CMIS1202	Business Systems Analysis, Design and Development	3 (75)
Total		**12**

Summer II

CODE	COURSE	CREDITS (HOURS)
PSYS1111	Introduction to Psychology I	3
WOEP1100	Work Experience	3
	Elective *	3
MGMT2405	Small Business Management	3
Total		**12**

***Foreign Language is recommended as an elective**

10. Programme Profile

In addition to core content, there are some components that will be infused into the programme to promote holistic development of graduates. Infusion of these elements will be done through strategies such as presentations, seminars and workshops and will not affect the length of the programme.
The programme features the following components: -

- **Work Experience/ Practicum**

  Learners are required to complete six (6) weeks (240 hours minimum) of industry attachment/practicum or work experience during the training. The hands-on nature of the teaching and learning process ensures that learners complement their knowledge with practical skills. This will provide an opportunity for them to apply and strengthen the knowledge, skills and attitudes acquired during their training in the programme.

- **Entrepreneurship**

  The programme aims to continue the development of entrepreneurial competencies of graduates, including their level of creativity and innovation to enable them to successfully operate a business venture and/or create new products/services, which should ultimately lead to the creation of employment and wealth for self and others. The focus of this component will be:

  - Applying knowledge of financial requirements for operating a business.
  - Demonstrating knowledge of production and operations management.
  - Outlining principles and practices of business law.

- **Employability Skills**

  The programme promotes development of the following critical employability skills:

  - Communication

- Professionalism and Ethics
- Teamwork
- Problem Solving and Critical Thinking
- Leadership
- Planning and Organizing
- Appreciation of Diversity

- **STEAM**

The programme is designed to produce graduates of the highest calibre who are not only able to function effectively and efficiently in the workplace but are also able to make significant contributions to the growth and development of their workplaces and the industry. As such, the courses incorporate relevant aspects of Science, Technology, Engineering, Arts and Mathematics (STEAM) in real-world and problem-based contexts. This supports the development of graduates who possess critical 21st-century skills that drive innovation. The core STEAM Skills include the following:

- Inquiry
- Communication
- Self-direction
- Problem Solving
- Creativity and Innovation
- Collaboration
- Analysis and Critical Thinking
- Applications of technology

- **Foreign Language**

Most programmes include a conversational course in Spanish, or German, Mandarin or French. It is intended to introduce learners to the fundamentals of the foreign

	language (phonics, grammar, syntax, vocabulary, etc.) and culture. The focus of the course is conversational competence. This will equip graduates to communicate competently at this level in a foreign language in current and emerging labour markets.
• **Gender Sensitivity**	The programme is designed to produce graduates who are conscious of the need to avoid gender stereotyping and making gender distinctions that limit the roles of men and women based on sex or gender.
• **Cultural Diversity/Sensitivity**	The programme is designed to produce graduates who are sensitive to the cultural diversity within the wider society. Learners are encouraged to have an appreciation of the need to coexist in an institution with variations in religion, ethnicity, racial and socio-economic situations. Learners should understand how to be tolerant and to be accommodating to persons of other cultures.
• **Sustainable Environmental Practices**	Learners are required to develop awareness of environmental issues and their correlation with sustainable development. Sustainability and current environmental practices must be infused in training and in practice. Examples of areas that should be included are: protection of the environment, optimizing use of resources and ensuring use of environmentally friendly products and methods of waste disposal.

11. Delivery and Learning Strategies

The methods of delivery or modes of instruction and learning are expected to deliver/facilitate content appropriate to the learning outcomes and learning styles of students to ensure mastery of the outcomes. The teaching-learning strategies to be employed will incorporate relevant and current technologies and will also include but are not limited to:

- Interactive lectures
- Simulations
- Demonstrations
- Project-based learning
- Field-based learning
- Case studies and Analysis
- Role plays
- Research
- Observations
- Presentations
- Laboratory exercises
- Self-directed learning
- Problem solving
- Discussion
- Guided practice
- Guest Lectures

The delivery and learning strategies/modes of instruction are intended to align with the aims of the programme.

Faculty members or teams will determine the appropriate teaching/learning strategies for each Curriculum Unit, based on the intended learning outcomes, the needs of their learners and the availability of resources. It is intended that teaching/learning strategies utilized are those which encourage mastery of the learning outcomes and the progressive development of critical workforce skills.

12. Assessment Strategies

Assessment of student learning is aligned with the stated intended learning outcomes for each course. It involves a multi-faceted approach which is used to assess students' mastery of the outcomes with emphasis on critical workplace skills. For this reason, assessment provides an opportunity for students to apply theory to practice in authentic settings and at the end of the semester, to demonstrate the level of learning that has taken place.

There is a pre-defined ratio [1]of coursework to end of semester examination[2]. The ratio and format of the examination may be different among courses.

1. **Assessment**

   a. Coursework:

   Coursework will be a combination of any of the following:

Laboratory activities	Portfolio
Field based assessment	Oral Examinations
Projects (individual or group)	Demonstrations

   b. Final Examination

   In an effort to enhance quality, there is a standardized examination for each course, which is common to all colleges. There are typically three (3) examination sessions within an academic year: December, May, and August. The end of semester examination (Final Examination) will be a combination of any of the following**:**

   i. Multiple Choice Questions (MCQs)
   ii. Structured Questions (SQs)
   iii. Practical Assignments (PAs)

[1] The applicable ratio of coursework to end of semester examination is found in the respective course outline

[2] In reference to the end of semester examination (Final Examination), with duration of two (2) hours.

13. Grading Scheme

Grading

Typically, a student's final grade is calculated by the combination of the course work grade and the final examination grade. The specific course outline can be consulted regarding the applicable grading scheme.

A student who attains a combined grade of:

a. 50% or more is deemed to have passed the course.

b. at least 45% but less than 49% is deemed to have failed the course and qualifies for a supplemental examination[3].

c. less than 44% is deemed to have failed the course and will be required to repeat the course in its entirety.

Examination Grades, Points and Distribution

Effective Academic Year September 2014

Percentage Scale	Grade	Grade Point	Student Performance Description
90-100	A	4.00	**Excellent**
80-89	A-	3.67	
75-79	B+	3.33	**Good**
70-74	B	3.00	
65-69	B-	2.67	
60-64	C+	2.33	**Satisfactory**
55-59	C	2.00	
50-54	C-	1.67	
45-49	D+	1.33	**Marginal Fail – Re-sit**
40-44	D	1.00	**Fail – Redo**
0-39	U	0.00	**Unsatisfactory**

[3] The supplemental examination must be done at the next available sitting within the current academic year. The grade received therein shall be the student's final grade for the course. A student who fails a supplemental examination is required to repeat the course in its entirety.

14. LEVELS OF AWARDS

BACHELOR OF SCIENCE		ASSOCIATE OF ARTS ASSOCIATE OF SCIENCE	
G.P. A	Classification	G.P. A	Classification
3.70 - 4.00	First Class Honours	3.70 - 4.00	Honours
3.30 - 3.69	Second Class Honours (Upper)	2.70 - 3.69	Credit
2.70 - 3.29	Second Class Honours (Lower)		
1.70 - 2.69	Pass	1.70 - 2.69	Pass

15. Graduate Profile

Graduates from the Applied Computer Science Associate Degree programme should be:

1. technologically competent
2. work-ready
3. self-directed
4. life-long learners
5. critical thinkers
6. problem-solvers
7. socially and culturally aware
8. contributors to community and national development
9. team players
10. good communicators
11. entrepreneurial
12. environmentally aware
13. gender inclusive
14. ethical and professional

16. Employment/Career Opportunities

Graduates from this programme should be able to work as:

1. Small business entrepreneur
2. Technical Support Specialist
3. Junior programmers

Graduates should also be able to matriculate into a Bachelor Degree in Computer Science.

17. Course Descriptions

Business Systems: Analysis, Design and Development (CMIS1202)

This course will expose students to Systems Concepts and the Systems Development Life Cycle namely Analysis, Design, and Implementation. Emphasis will be on solving business problems with systems analysis and design. Learners will also develop a more complete understanding of business applications. The course will culminate in the development of a realistic computer application conforming to system designs specifications. learners should gain experience through practice of assimilating problems, designing solutions to data processing problems.

Communication I (COMM1101)

This course is designed to meet the academic communication needs of students at the tertiary level. It is aimed directly at students entering the community college. The course seeks to develop the students' ability to participate fully in academic discourse. Emphasis is placed on the development of language in both speech and writing in a variety of contexts. Additionally, the course will strengthen the students' ability to communicate effectively for different purposes.

Focus is also given to the Jamaican language situation as this will assist students – many of whom are from creole speaking backgrounds- to achieve greater proficiency in Standard English.

This course is of particular importance because it will expose the students to the principles of the APA referencing style, which are fundamental to the academic writing that will be required throughout their course of study.

Communication II (COMM1202)

In order to meet the demands of the global market, one must be an effective communicator. Therefore, this course seeks to develop proficiency in communication, through the production and presentation of formal discourse in speech and writing using conventional standards and appropriate methods.

It is designed to provide students with opportunities to produce different types of oral and written communication while selecting and combining forms, media, channels, and technologies to maximize communication. Specific emphasis will be placed on producing formal business documents such as letters and reports.

Computer Organization and Architecture (IARC2001)

This course introduces the computer hardware and provides opportunities for analysis and evaluation of their interaction and organization. It emphasizes key concepts and hardware processes such as computer architecture, central processing unit, instruction sets and assembly, computer logic and arithmetic, memory systems, pipelining, microprogramming, multicycling, parallelism, interfacing, peripherals, multiprocessors, and modern computer architectures.

Computer Programming, I – (C#OOP, File Management &DB) (CPRG1205)

This course is designed to give the learner a working knowledge of the principles of object-oriented programming. It is also intended to provide students with the knowledge needed to craft object-oriented solutions to problems and to implement the solutions using c#. Topics covered will include arrays, advanced data types, concepts, operators, classes, threads, generics, overloading, inheritance (abstraction), and exception handling.

Database Management (CSYS2404)

Learners will be exposed to database concepts including functional dependencies, SQL, and normalization. Emphasis will be placed on the creation and manipulation of databases using Oracle, but this can be extended to any available DBMS.

Discrete Mathematics and Algebra (MATH1103)

This course equips student with the relevant mathematical concepts and methods required for adequately undertaking courses in data processing management techniques and related areas. It aims to advance students' appreciation of and abilities in the use of mathematics as a precise model of thought and communication as well as a tool for modelling various problem situations arising in data processing and the business world at large.

Fundamentals of Data and Algorithms Analysis (IDAA2001)

This course builds upon the work completed Introduction to Programming to introduce the fundamental concepts of data structures and the algorithms that proceed from them. It focuses on recursion, the underlying philosophy of object-oriented programming, fundamental data structures (such as queues, stacks, linked lists, hash tables, trees, and graphs), sorting and searching techniques, and the basics of algorithmic analysis. Labs provide hands-on programming experience that is vital for beginning programmers and computer science students.

Fundamentals of Information Technology (ITEC1104)

This course is designed to provide students with a comprehensive knowledge of the application of computers in different organizations. It includes a thorough introduction to computers and information technology, information systems, computer networks and systems security. It also aims at equipping students with practical operating system, word processing, presentation, spreadsheet, database, and internet search techniques skills.

Introduction to Computer and Network Security (CSYS1102)

This course provides learners with the knowledge and skills to begin supporting network security within an organization. Data security concepts inclusive of key information assurance concepts and practices such as encryption, authentication, risk analysis, security policy design, digital forensic, cloud computing and implementation. Learners who complete this course will be able to identify security threats and vulnerabilities and help respond to and recover from security incidents.

Introduction to Graphics (IGRA1101)

This course introduces participants to computer graphics. The college has the choice of using Photoshop, Coreldraw or any Open-Source software.

Introduction to Management (MGMT1101)

This course is designed to provide students with a comprehensive introduction to the range of decisions encountered by managers in business organizations. Emphasis will be placed on the application of the theories of management with a view of highlighting the managerial functions.

Introduction to Parallel and Distributed Computing (IPAR2001)

This course provides an integrated view of the various facets of software development on such systems: hardware architectures, programming languages and models, software development tools, software engineering concepts and design patterns, performance modelling and analysis, experimenting and measuring.

Introduction to Programming (CPRG1201)

This course is designed as the first course in structured computer programming with an emphasis on problem solving techniques and structured algorithm development approach. The knowledge acquired from the study of this course will serve as a basis and a pre-requisite for all subsequent programming courses. The C# language will be used to illustrate all concepts taught.

Introduction to Psychology I (PSYC1111)

This course is designed primarily to provide students with a general understanding and appreciation of human behaviour and its impact on social and business relationship. More specifically, the course will cover approaches to the study of psychology, biological and developmental bases of behaviour, perception, personality, attitude, motivation, conflict and change and stress management.

Networking and Communication Technology (CSYS1208)

This course begins with a simple and comprehensive introduction of data communication. Students are then exposed to various technologies, topologies, media, devices, protocols, networking standards and architectures. Students will also be practically guided in the construction and crimping of cat 5 Ethernet cables. Students are given the opportunity to learn how to design and implement wired and wireless networking and become aware of the role of the systems administrator and network operating systems. The course also includes common security issues encountered by network users.

Oral communication (COMM2301)

The focus of this course is to help students improve speech habits and develop strategies for effective oral communication.

Probability and Statistics (MATH1206)

This course introduces students to the language, logic and application of probability and statistics. It further enables students to apply the principles of statistics to solving problems and develop decision making skills. The course also shows how to present data to other people in ways that are clear and accurate using statistical software packages.

Small Business Management (MGMT2405)

This course is designed to provide learners with an understanding of the requisite tools used in small business management. It will expose learners to the concept of entrepreneurship and the techniques used in launching a small business. In addition, this course will enable learners to understand and apply principles that are critical to developing, growing, and managing a new business; the learner should demonstrate mastery by development of a business plan.

Web Development I - Using HTML5, JAVA Script & CSS3 (CWEB1205)

This course is designed to provide the necessary skills and training in the area of Web Design. The class will focus on web page planning, basic design, layout and construction, publishing and maintenance using HTML, JavaScript, and various creation tools.

Work Experience (WOEP1101)

Work Experience (WE) is designed to provide learners with 'hands-on' experiences in a real-world professional setting prior to completion of their degree program. It is intended to prepare learners for the rapidly changing social, economic, and technological environment of the modern workplace and allow learners to translate theory into practice for professional growth and development. Learners will also be exposed to team building, interpersonal, customer service, communication, decision-making, and other work-related skill.

18. Requirements for Students

General Guidelines

The learner is required to:

1. attend classes at the prescribed dates and times.
2. exercise intellectual honesty.
3. acquire the prescribed textbook (s)/resource materials.
4. participate in class activities.
5. undertake work in his/her assigned group.
6. successfully undertake all assignments and examinations.

Promotion

1. Promotion to the subsequent year of a programme is based on the number of credits attained and successful completion of required courses. Students with more than nine (9) credits outstanding will **NOT** be promoted to the **second year** of an **Associate degree** programme or in the case of the Bachelor's degree, will **NOT** be promoted to the **fourth year**.

2. Students who are asked to repeat the academic year of a programme may be allowed to do a maximum of fifteen (15) credits in each semester, provided that there are no timetable clashes. (No special arrangement will be made to accommodate these students for classes or examinations)

19. Award of Degree

There are six (6) possible awards available:

1. Certificate
2. Associates of Arts
3. Associate of Science
4. Associate of Applied Science

To be awarded any of the above qualifications, a student must have:

1. completed all credits as specified by the programme.
2. completed all courses as specified by the programme.
3. completed two hundred and forty (240) hours of Work Experience.
4. completed thirty (30) hours of Community Service.
5. met all other requirements as outlined by individual colleges and the Council of Community Colleges of Jamaica.

20. Resources for Programme

Human Resource

1. Lecturers - Lecturers on the programme should possess a minimum educational qualification of a first degree in the relevant subject area and at least a certificate in teacher education for the Associate Degree programmes. Lecturers at the Bachelor's degree level must have a minimum of a Master's degree and certification in Teacher Education.

2. Consultants – trainee
3. Partners – work experience
4. Resource personnel from relevant industries

Infrastructural Services

1. **Physical Facilities**

    a. Well-lit and ventilated classroom with appropriate furniture, and audio-visual aids.

    b. Labs with the hardware and software necessary for delivery of the programme.

2. **Information Technology**

    a. Computers with Internet Access Software:

        i. Productivity Tool e.g. MS-Office.

        ii. MS-Windows Operating system and other relevant operating systems.

21. References

1. Labour Market Research and Intelligence Department. (2014). *2014-2015 HEART Trust NTA projected enrolment: Labour market alignment analysis*. Kingston, Jamaica: HEART Trust/NTA.

2. Labour Market Research and Intelligence Department. (2014). *Skills demand and employers' satisfaction survey 2014/2015*. Kingston, Jamaica: HEART Trust/NTA.

3. Planning Institute of Jamaica. (2014). *Economic and social survey- Jamaica 2013.* Kingston, Jamaica: PIOJ.

4. Zacks.com (2014). *Business services-The shift is on- Industry outlook*. Retrieved from http://www.nasdaq.com/article/business-services-the-shift-is-on-industry-outlook-cm369579

5. http://www.indeed.com/q-Electro-Mechanical-Technician-l-North-Carolina-jobs.html

COURSE OUTLINES

THE COUNCIL OF COMMUNITY COLLEGES OF JAMAICA

COURSE NAME:	Business Systems: Analysis, Design and Development
COURSE CODE:	CMIS1202
CREDITS:	3
CONTACT HOURS:	75 (30 Theory Hours, 45 Hours Practical)
PRE-REQUISITE(S):	Fundamentals of Information Technology
CO-REQUISITE(S):	None
SEMESTER:	

COURSE DESCRIPTION:

This course will expose students to Systems Concepts and the Systems Development Life Cycle namely Analysis, Design, and Implementation. Emphasis will be on solving business problems with systems analysis and design. Learners will also develop a more complete understanding of business applications. The course will culminate in the development of a realistic computer application conforming to system designs specifications. learners should gain experience through practice of assimilating problems, designing solutions to data processing problems.

COURSE OUTCOMES:

Upon successful completion of this course, learners will be able to:

1. appreciate the use of information systems in business operations.
2. explain the phases of the Systems Development Life Cycle (SDLC).
3. evaluate system analysis and design activities for a proposed system.
4. apply system analysis techniques that are used for the creation of system documentation.

UNIT I – Introduction to Systems Analysis and Design (6 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. explain system analysis and design concepts.
2. define a system analyst.
3. describe the responsibilities of the systems analyst.

4. justify the qualities of a systems analyst.
5. describe the roles of the systems analyst.
6. identify stakeholders involved in the system analysis and design process.
7. explain the importance of the role of the user in system analysis and design.
8. explain how systems analysts and project teams manage the expectations of the user.
9. identify the ethical issues raised by information systems.
10. identify the legal issues raised by information systems.
11. simulate the establishment of an IT business.
12. assemble a system development team.

Content:

1. Basic system analysis and design concepts.
   a. Define Systems Analysis and Design.
   b. Concepts-System, Sub-system, Open system, Closed system, Business System, Information system.

2. Who is a systems analyst?

3. Responsibilities of the systems analyst (examples -
   a. Investigate the problem.
   b. Analysis business requirements.
   c. Estimate cost.

4. Qualities of a systems analyst.
   a. Problem solver.
   b. Communicator.
   c. Computer experience.
   d. Personal and professional ethic.
   e. Self-discipline.
   f. Management and coordinating skills.

5. Roles of the systems analyst–consultant, agent of change, supporting expert.

6. Stakeholders in systems analysis and design–user, customer, systems development team.

7. The importance of the user in system analysis and design.

8. The role of the user in system analysis and design.

9. Managing user expectations – timeframes and deliverables expected by users.

10. Ethical issues raised by information systems:
    a. Moral dimensions of information systems.
       i. Information rights–privacy and freedom.

ii. Intellectual property rights.
iii. Accountability, liability, and control.
iv. System quality.
v. Quality of life–equity, access, and boundaries.

b. Professional codes of conduct.

11. Legal issues in developing information systems/software.
    a. Data protection Act.
    b. Data retention Act.
    c. Intellectual Property.

12. Business name, logo slogan mission, vision.

13. System Development Team roles and responsibilities.

UNIT II – The Systems Development Life Cycle (4 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. identify the phases of the systems development life cycle (SDLC).
2. describe the activities in each phase of the SDLC.
3. identify the end products of each phase of the SDLC.
4. explain the rules for technical report writing.
5. compare the waterfall and evolutionary models of system development.

Content:

1. Define SDLC.
2. The phases of the SDLC – 7 step phase.
3. The end products of the phases of the SDLC.
4. Technical report writing – rules, sample report layouts.
5. Models of the System Development–– waterfall, evolutionary models.

UNIT III – SDLC Phase – Preliminary Investigation – Feasibility Study (6 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. identify activities in the preliminary investigation phase.

2. evaluate the most appropriate fact-finding technique for a given situation.
3. apply the use of fact-finding techniques in information gathering.
4. examine the different areas of feasibility.
5. demonstrate the use of project scheduling tools.
6. create a feasibility study report.

Content:

1. Preliminary investigation activities.
2. Fact finding/data gathering techniques – procedure manuals, interviews, questionnaires, forms analysis, observation, JAD sessions.
3. Define feasibility study.
4. Types of feasibility – operational, schedule, economical, technical.
5. Project scheduling – Gantt charts and PERT diagram.
6. Feasibility study report.

UNIT IV – SDLC Phase – Detailed Investigation – Requirements Definition (4 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. identify activities in the detailed investigation phase.
2. critique an existing business system (manual or automated).
3. select appropriate types of system requirements for a given environment.
4. explain the importance of proper requirements.
5. use fact finding techniques to identify requirements.
6. determine the requirements for a proposed system.
7. create the statement of requirements report.

Content:

1. Detailed investigation activities.
2. Using fact finding techniques.
3. Overview and criticism of existing system.
4. Description of Proposed system.
5. Functional and non-functional requirements.
6. Types of System Requirements – Input requirements, Output requirements, Process requirements, Performance requirements, Control requirements.
7. The importance of proper requirements in system analysis and design.
8. Statement of requirements report.

UNIT V – SDLC Phase – Analysis of requirements – Tools and Techniques (9 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. determine system requirements.
2. choose the appropriate method of acquiring a business system.
3. construct system analysis and design tools.
4. create the proposal report.

Content:

1. Analysis of requirements:
   a. Different stakeholder views, Conflicts in requirements, Trade-off in stakeholder requirements.

2. Commercial-Off-The-Shelf (COTS) versus Custom Built (Bespoke).
   a. How to select an appropriate application package–user analysis, cost/benefit analysis.

3. Systems Analysis and Design Tools:
   a. Dataflow Diagrams (DFDs) – Symbols, Naming conventions, Errors, Context level diagram, First level diagram, balancing, exploding.
   b. Decision Tables – conditions, alternatives, rules, actions.
   c. System flowcharts –symbols, processing logic.

4. Proposal report.

UNIT VI – SDLC Phase – (15 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. distinguish between design philosophies.
2. explain the problems of system design.
3. create inputs, outputs, databases, user interfaces, data entry and program designs.
4. examine system design controls.
5. determine resources needed for system design.
6. create the system specification document.

Content:

1. Design philosophies–top/down, bottom/up.
   a. Advantages and disadvantages of both approach.

2. Problems associated with the system design phase:
   a. Fit user requirements
   b. Unrealistic timelines
   c. Unrealistic budget
   d. Changing in requirements
   e. Fear of changes
   f. Lack of communication between stakeholders
   g. Unmotivated team etc.

3. Areas of design and associated objectives.
   a. Input design and objectives (screens, forms).
   b. Output design and objectives (reports, displays)
   c. Database design and objectives (File organization and access methods, Data dictionary, ERDs –symbols, relationships, cardinality).
   d. User interface design and objectives.
   e. Data entry design and objectives.
   f. Coding systems: sequence, block sequence, alphabetic derivation, mnemonic, cipher, function, classification, significant digit subset, self-checking codes.
   g. Program design.
      i. Program logic.
   a. Program flowcharts, pseudocode, algorithms.
   b. UML diagrams – use case, activity, sequence, component
      ii. Processing modes – batch, real time, online, interactive.

4. System Design Controls:
   a. Purpose of controls.
   b. Types of controls - Document flow, security, logic, information flow etc.

5. System Design Resources:
   a. Hardware resources–input devices, output devices, processing devices, communication, and storage.
   b. Software resources–system software, support application software.
   c. Human resources–system design team (project manager, systems analyst, programmer, documentation specialist etc.).

6. System Specification report.

UNIT VII – SDLC Phase – Development and Documentation (20 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. describe concepts of system development.
2. identify system documentation standards.
3. explain types of internal and external documentation.
4. use a chosen programming language to develop a functional information system or application.

Content:

1. Define 'system development'.
2. Development concepts – Programming, coding, programming languages.
3. What is system documentation?
4. System documentation standards – ANSI, ISA, IEEE.
5. Systems documentation:
   a. Internal – design documents, operations manual, data entry specifications, data control.
   b. External – user manual, online/offline help, management summary.
5. Develop a functional system or application.

UNIT VIII – SDLC Phase – Testing and Maintenance (6 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. differentiate between testing and debugging.
2. explain testing concepts.
3. explain the types of testing.
4. explain reasons for maintaining systems.
5. create a test plan for a system.
6. identify the types of maintenance.
7. identify change management concepts.
8. describe business process re-engineering.

Content:

1. Testing concepts.
   a. Testing versus debugging.
   b. Errors during testing – syntactic versus semantic.
   c. Error Avoidance.
   d. Error Identification and detection.
   e. Tolerance.

2. Types of Testing:
   a. Methodologies- Black box versus White box testing.
   b. Categories-Static versus Dynamic Testing.
   c. Unit testing, System Testing, User Acceptance testing, Portability testing, Integration testing, Stress testing.
3. System Test Plan.
4. Maintenance reasons – Faults of omission, faults of commission.
5. Types of maintenance–corrective, adaptive, perfective.
6. Change management – consider version or release management approaches.
7. Business process re-engineering – modelling, analysis, simulation.

UNIT IX – SDLC Phase – Implementation and Evaluation (3 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. define 'implementation'.
2. explain the implementation concepts.
3. define training.
4. describe the contents of a training manual.
5. explain the conversion methods.
6. explain the purpose of system evaluation.
7. create an implementation document.

Content:

1. Define 'implementation and training'.
2. Implementation concepts - User training, conversion methods, system evaluation.
3. Guidelines for training– objectives, methods, training sites, training materials/manual, target audience, trainers– in-house/external trainers.
4. Implementation/conversion methods– pilot, phased, cutover/direct, parallel.
5. Reasons for conducting system evaluation, post evaluation, review, audit, or feedback.
6. Implementation Document.

UNIT X – Emerging Trends in Systems Development (2 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. Describe emerging trends in systems Development.

Content:

1. Emerging trends in Systems Development.

MAJOR PROJECT PRACTICAL

System Development and Major Project (CSYS2403) Rubric

Business Information Portfolio
• Purpose for the information technology business
• Vision of business
• Mission of business
• Management roles and responsibilities for the business
• Business name
• Business slogan
• Business logo
• Business colour scheme o description – 1 o picture - 1
• System development team roles and responsibilities (at least 4 roles – 1mark each – along with 4 descriptions

System Identification and Project Selection
• Choosing the organization to be assessed
• Giving a general overview of the organization o History o Operations
• Selecting a functional area in the organization that may need an information system (e.g. Inventory, payroll, client management, library system, canteen, registration system)
• Determining the scope of study – specific aspect of the functional area
• Describing the current system being used - Complete description of the current system
• Identify pros and cons of the current system o Complete description of the pros and cons of the current system
• Overview of the problem o Complete and accurate description of the problem
• Proposing at least two (2) automated solutions for the identified problem o Complete description of each solution
• Selecting a project solution for system development o Project selection

○ Justification

• Overview of the problem to be solved as previously stated
• Overview of the proposed system – what the system should do - as previously stated
• Input requirements – inputs needed for the system e.g. Student details, course name, course grade, course credits
• Processing requirements – activities that need to be done by the system. e.g. Calculate GPA, generate progress report, generate class list
• Output requirements – information that the system produces. E.g. Progress report, class list ○
• Performance requirements – these are requirements on how the system should carry out its functions optimally. E.g. System should produce class list within 5 hours after end of registration; student files must be updated instantaneously after data entry.
• Control requirements – these deal with restrictions placed on the system to monitor or control access. E.g. Student grades must be added/changed or delete only by authorized personnel, different privileges to access student management system

Feasibility Report
• Overview of the problem to be solved as previously stated
• Overview of the proposed system – what the system should do - as previously stated
• Determining Economic feasibility ▪ Costs – Hardware, Software, Human Resource (system development). Complete accurate description of costs o Benefits – Tangible, Intangible ▪ Sound and relevant tangible benefits ▪ Sound and relevant intangible benefits o Cost/Benefit analysis ▪ Thorough appropriate analysis
• Determining Technical feasibility o Technology required - hardware, software, technology ▪ Complete and accurate description of technology required o Technical expertise required – human resource of development team ▪ Complete and accurate description of expertise required
• Determining Operational feasibility o Fact-finding techniques used to determine feasibility - at least 3 techniques ▪ Sound and relevant techniques used o Samples of Techniques used ▪ Appropriate items on samples o Analysis of data collected to determine how receptive potential users are to the proposed system
• Determining Schedule feasibility o Estimating proposed time to complete project using appropriate method (1) o Use of Project Scheduling tools to determine project times ▪ Work Breakdown Schedule ▪ Gantt Chart ▪ PERT Diagram ▪ Complete and accurate diagram with all relevant labels ▪
TOTAL

Systems Design Document
• Overview of the problem to be solved as previously stated
• Overview of the proposed system – what the system should do - as previously stated
• Use Dataflow diagrams, Flow charts and Entity Relationship Diagrams to represent the proposed system • **Dataflow Diagrams (DFD)** o Context Level Diagram ▪ Complete and accurate diagram of all relevant entities, data flows o Description of Diagram ▪ Complete and accurate description of diagram o Level 1 Diagram ▪ Complete and accurate diagram of all relevant processes, data flows and major data stores o Description of Diagram ▪ Complete and accurate description of diagram ▪ Partial description of diagram • **Flow Charts** o Diagram o Flow chart is logical, easy to follow and is an accurate description of the proposed system using appropriate symbols o Description of Diagram • **Entity Relationship Diagram (ERD)** o Diagram o Complete and accurate diagram of all relevant entities and relationships o Description of Diagram ▪ Complete and accurate description of diagram • **Produce a data dictionary showing the following headings:** o Field names o Data Type o Field Length o Null Value allowed? o Default Value o Key Fields/Primary Key o Description o Examples ▪ Complete and accurate items outlined in data dictionary
TOTAL

UNIT 6 – Development of Functional Information System
Design and Development of a functional Information system or application
TOTAL

UNIT 7 – System Testing Document
• Overview of the problem to be solved as previously stated
• Overview of the proposed system – what the system should do - as previously stated

• State how the following tests will be carried out:
 	
• Unit Testing
  o Describe how unit testing will be conducted. Who will write the test scripts for the unit testing, what would be the sequence of events of Unit Testing and how will the testing activity take place?
  ▪ Appropriate and well documented plan
 	
• Integration testing
  o Describe how Integration testing will be conducted. Who will write the test scripts for the integration testing, what would be sequence of events of System & Integration Testing, and how will the testing activity take place?
  ▪ Appropriate and well documented plan
• System Testing
  o Describe how System testing will be conducted. Who will write the test scripts for the system testing, what would be sequence of events of System Testing, and how will the testing activity take place?
  ▪ Appropriate and well documented plan
 	
• User Acceptance Testing
  o Describe how the User Acceptance testing will be conducted. Who will write the test scripts for the testing, what would be sequence of events of User Acceptance Testing, and how will the testing activity take place?
  ▪ Appropriate and well documented plan

Systems Documentation/Portfolio
• Overview of the problem to be solved as previously stated
• Overview of the proposed system – what the system should do - as previously stated
• Produce a user's manual o User documentation usually includes: ▪ List of **minimum hardware and software** required to use the system o How to **install** and setup the system ▪ Complete and accurate description o How to **start / stop** the system ▪ Complete and accurate description o How to **use the features** of the system (2) ▪ Complete and accurate description (2) o **Screenshots** showing the system in typical use (2) ▪ Complete and accurate screenshots (2) o Example **inputs and outputs** ▪ Complete and appropriate examples o Explanations of any **error messages** that might be shown ▪ Complete and accurate description o Common errors and how to correct them ▪ Complete and accurate guide

METHODS OF DELIVERY:

1. Lectures
2. Discussions
3. Research
4. Group Work
5. Individual Project
6. Presentations
7. Case Studies
8. Problem Solving

METHODS OF ASSESSMENT AND EVALUATION:

1. Common Coursework 40%
   (Documentation and Presentation - Feasibility study & statement of requirements, proposal, system specification)
2. Tests 10%
3. Implementation of Major Project System
4. Test Plan, Implementation Document, User Manual 10%

RESOURCE MATERIAL:

Prescribed:

Kendall, K.E., & Kendall, J.E., (2013). *Systems analysis and design* (9th ed.). NJ: Prentice Hall.

Recommended:

Curtis, G & Cobham, D. (2008) *Business information systems: analysis, design, and practice*, (6th ed.). NJ: Financial Times Press.

Laudon, K.& Laudon, J. (2009). *Management information systems* (11th ed.). NJ: Prentice Hall.

Shelly, G., & Cashman, T., (2013). *Systems analysis and design* (10th ed.). KY: Course Technology.

Valaicich, J. S., George, J. F., & Hoffer, J.A. (2014). *Essentials of systems analysis and design*. (6th ed.). NJ: Prentice Hall.

Weaver, P. Lambrou, N. & Walkley, M. (2002). *Practical business systems development using SSADM: a complete tutorial guide* (3rd ed.). NJ: Financial Times Press.

Other online resources:

https://www.**ebscohost**.com

THE COUNCIL OF COMMUNITY COLLEGES OF JAMAICA

COURSE NAME:	Communication I
COURSE CODE:	COMM1101
CREDITS:	3
CONTACT HOURS:	45 (45 hours theory)
PRE-REQUISITE(S):	None
CO-REQUISITE(S):	
SEMESTER:	

COURSE DESCRIPTION:

This course is designed to develop the community college learner's ability to write expository essays, 'projects or papers' and make oral presentations in varying contexts in and out of the classroom. It is hoped that this course will be used by learners to help them fulfil the academic evaluation requirements of the courses they will sit at this level and help them to become better communicators. The course gives learners practice in the manipulation of secondary sources of information to support their own ideas in writing and speech.

REQUIREMENTS FOR THE COURSE:

Access to if not your own Computer, access to the internet, books, journals, newspapers, magazines, a library membership, and an open mind hungry for knowledge.

COURSE OUTCOMES:

Upon successful completion of this course, learners will be able to:

1. demonstrate academic writing skills.
2. manipulate varied, credible, and reliable sources to present informed and supported points of view.
3. create competent expository essay.
4. produce competent oral presentations.
5. employ the APA style in their academic endeavours, writing, presentations, and research.

UNIT I – What is Communication (8 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. define 'communication'.
2. identify ways in which selective factors influence the communication process.
3. describe five (5) techniques for effective communication.
4. explain transactional model of communication.
5. demonstrate efficient note taking using the Cornell Method.

Content:

1. Definition of communication.
2. Communication Process.
3. Factors influencing the communication process: age, sex, culture, family situations, religion, self-concept, education, etc.
4. Barriers to communication (Internal / External; semantic and language; Physical, psychological, physiological).
5. Effective communication techniques: listening, paraphrasing, direct questioning, clarifying, focusing, silence and other techniques.
6. The Cornell Method: http://lsc.cornell.edu/wp-content/uploads/2015/10/Cornell-Note_Taking-System.pdf.

UNIT II – Language in the Caribbean Context (7 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. define 'language'.
2. Discuss the historical and social factors that have shaped the Caribbean language situation.
3. examine areas of divergence between Creole and Standard English.

Content:

1. What is a language.
2. Historical factors and social factors that affected the development of the Caribbean language situation.
3. Comparison of Standard English and Caribbean Creole- lexicon, semantics, phonology, morphology, syntax.

NB. Language used in text message and its departure from the standard form.

UNIT III –Introduction to Oral Presentations (10 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. describe the basic types of oral delivery.
2. deliver a 3–5-minute oral presentation.
3. use a PowerPoint or other visual aid in an oral presentation.
4. manage emotional anxiety during an oral presentation.

Content:

1. Types of Delivery:
   a. Memorised
   b. Manuscript
   c. Impromptu
   d. Extemporaneous
2. Basic Visual Aids, Charts, PowerPoint, Models.
3. Preparing a basic power point presentation.
4. How to overcome emotional anxiety.

UNIT IV –The Writing Process (20 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. construct a thesis statement.
2. use connectives and transitional devices appropriately in the writing process.
3. incorporate research materials in the writing process.
4. construct well developed paragraphs.
5. use peer review and editing techniques to review written work.
6. use prewriting and planning strategies in the writing process.
7. use the APA referencing and in text citation in the writing process.
8. employ post writing strategies in the writing process.

Content:

1. Introduction to paragraph development.
2. Topic Sentences.

3. Supporting Sentences: details such as examples, illustrations, statistics, facts.
4. Concluding sentence/clincher.
5. Cohesion, unity, adequacy, and completeness.
6. Pre-writing: Planning, idea generation and research.
7. Writing:
   APA Referencing:
   a. Sources of information
   b. In-text citations
   c. List of references
   d. Plagiarism
8. Post writing: Publishing.

METHODS OF ASSESSMENT AND EVALUATION: Continuous Assessment

1. Course work/Test/ Quizzes 35%
2. Portfolio: 50%
   a. Bibliography
   b. Formal Outline for the essay
   c. 1st Draft
   d. Peer Review
   e. Final Draft
3. Individual oral presentation lasting 3-5minutes 15%

RUBRICS

Learner Presentation Rubric

Oral Presentation Rubric v 2	Good	Average	Needs Improvement	Sub Total	Total
Delivery; Clarity of voice Projection of Voice	3	2	1		
Control of Emotional Anxiety Breath Control, Para Language, Movement	3	2	1		
Integration of Visual Aid	3	2	1		
Time Management Speech presented within the stipulated time	3	2	1		

Content Presentation of a Main Idea Development of at least 1 point 1 point 2 sub points	3	2	1		
Organization Introduction: attention getter, topic, thesis, body: one point adequately developed, conclusion: restate of thesis / summation	3	2	1		**/15**

Review Rubric, can be used for stage reviews, peer review of draft essay

. Feature	E VG G A F P	Comment
Thesis State.	6 5 4 3 2 1	Main idea, Major Points
Outline	6 5 4 3 2 1	Logic, planning, format
Sources	6 5 4 3 2 1	Reference page, in text citation
Paragraphing	6 5 4 3 2 1	Emphasis, Coherence, Cogency, Unity, Organisation/Order
Transitions	6 5 4 3 2 1	Internal summaries, previews, Signposts, conjunctions
Introduction	6 5 4 3 2 1	Thesis statement, attention getter, if arg- + opinion
Body	6 5 4 3 2 1	Paragraphs well developed clear rhetorical Organisation
Conclusion	6 5 4 3 2 1	No new points, summarize, restate, tie up, the body and intro
Tone	6 5 4 3 2 1	Objective-expository, subjective- persuasive-
Spelling	6 5 4 3 2 1	
Subject Verb	6 5 4 3 2 1	
Tense	6 5 4 3 2 1	
Punctuation Capitalisation	6 5 4 3 2 1	
Worldliness	6 5 4 3 2 1	
Sentence Cons. Parallelism	6 5 4 3 2 1	
Reviewer's comment		Lecturer's comment

Expository Grade Breakdown

I. **Content** – 10 marks

10 – 9 V Good
Clear development of main points.
Rational reasoned coherent presentation of analysis.
At least three points must be adequately developed with corresponding supporting points.
To get full marks.

8- 7 Good
Clear development of main points.
Rational reasoned coherent presentation of analysis.
Less than three points adequately developed with corresponding supporting points.

6-5 Average
Clear development of main points.
Rational reasoned coherent presentation of analysis.
Less than three points.
Points not adequately developed with corresponding supporting points.

4-1 Below Average
No development of main points.
No supporting points.
Incoherent or non-existent analysis.

II. **Organization** - 8 marks

a) Paragraphing. - 1 mark

b) Rhetorical strategy – analysis, cause and effect, classification, comparison, definition, illustration. - 2 marks

c) Introduction – that contains a thesis, which includes:
1. 3- 5 main points of the essay.
2. main idea.
3. attention getter. - 3 marks

d) Conclusion
1. Recap, summation, restating.
2. No new points. - 2 marks

III. **Expression/Use of English**	-	7 marks
a) Academic Grammar, Word Choice, Tone	-	2 marks
b) Punctuation	-	2 marks
c) Subject Verb Agreement	-	2 marks
d) Connectives	-	1 mark

ASSIGNMENT ELECTRONIC SUBMISSION

These assignments should utilise Turnitin software, where applicable, if that is not available your teacher will instruct you of an alternate electronic means of submission. As your course evaluation is ongoing, students are encouraged if not required to send sections of their assignments to their lecturers for review, generally speaking you are taught a task this week the homework is required a minimum of 1 day before the first class in the next or following week.

This is so for several reasons:

1. Based on the submissions the teacher can tailor or review a section that the class may have misunderstood, for use in the next class.

2. The learner and teacher can submit their assignment and comment at any time convenient to them before the next class.

Electronic submissions are recommended because it facilitates the advantages named above as well as it: ...

1. cuts printing costs.
2. and is a record of submission.

NON-SUBMISSION

Please note that if you miss a submission deadline your grades may be lower than a student who consistently sends in his submission on time as your lecturer may penalise you or refuse to mark the specific submission. It is recommended that you email your lecturer early seeking permission to submit a stage of an assignment late. Do remember lecturers are accommodating but it is at their discretion that they allow a late submission.

Please be aware however that study is a reality of deadlines and pressure to meet deadlines.
Remember that you have to complete all stages of the course as well as the final projects at the level of competence to pass the course.

RESUBMISSION

The course is designed to develop learner competence thus a student is allowed one resubmission if they fail a submission or submission is below competence. However, in such a case the learner's grade for that specific assignment is the average of the two submissions. As the course is competency based, for a learner to pass they have to demonstrate competence in both stage and final product. That is all stages of the essay writing process, expository and argument and the presentation making process, as well as in the expository essay, argumentative essay, and presentation.

Required Text

The majority of units will be taught using a variety of material prepared by your teacher; many teachers will give you a website, page url or blog containing the material. Some may recommend chapters or pages in textbooks that best explain specific areas. We recommend that you copy or read these recommended excerpts which usually are available in your school library. However, an essay writing manual and there are many, for eg A Writers Guide: a handbook for writing and research by Maimon & Perez will help a student immensely. Not only because it provides good information on the essay writing process but also because it can be used as a resource for referencing.

Blooming with the Pouis 2009 Ramsay et al, introduction p xxi, Introduction to Argument p 131
Writing in English, 1999, Mcdinald et al; Chapters 10, 18 -24
The Art of Public Speaking, 2007 Stephen Lucas; Chapters 10,12,13,14

All the texts named above have been referenced in the syllabus guide, however they can and should be supplemented by other texts and approaches to the topics.

Recommended Texts

Any college essay writing text.

NB: LEARNERS who FAIL this course are required to do an automatic RE-DO.

THE COUNCIL OF COMMUNITY COLLEGES OF JAMAICA

COURSE NAME :	Communication II
COURSE CODE :	COMM1202
CREDITS:	3
CONTACT HOURS:	45 (45 hours theory)
PRE-REQUISITE(S):	Communication I (COMM1101)
CO-REQUISITE(S):	None
SEMESTER:	

COURSE DESCRIPTION:

In order to meet the demands of the global market, one must be an effective communicator. Therefore, this course seeks to highlight the various routes of communication and also examine a variety of business documents used in communicating. This will assist learners in developing proficiency in communication. It is designed to provide learners with opportunities to produce different types of oral and written communication while selecting and combining forms, media, channels, and technologies to maximize communication. Specific emphasis will be placed on producing formal business documents such as letters and reports.

COURSE OUTCOMES:

Upon successful completion of this course, learners will be able to:

1. distinguish between the types of business documents.
2. demonstrate competence in producing formal business documents.
3. respond appropriately to various business-related scenarios.

UNIT I – Contexts of Communication (8 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. analyse the different contexts in which communication takes pace.
2. distinguish between formal and informal communication context.

3. use examples to illustrate the different contexts how the affect the nature of communication in organizations.

Content:

1. Types of communication contexts.
2. Formal versus informal communication contexts.
3. Nature of communication in the organizational communication context.

UNIT II– Routes of Communication (8 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. distinguish among the various communication routes.
2. cite instances in which each route is used.
3. illustrate through oral or written presentation how the different contexts affect the nature of communication.
4. analyze the different contexts in which communication takes place.
5. use examples to describe instances in which formal and informal communication take place.

Content:

1. Routes of Communication - vertical, lateral, diagonal, and other uses.
2. Contexts of communication - intra-personal, inter-personal, small group and large groups.
3. Formal and informal, grapevine, bypassing.

UNIT III – Business Documents (29 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. collect and exhibit samples of specific written business communication.
2. compose formal letters using appropriate format, content, and tone.
3. compose the letter appropriate to the given situation.
4. sequence ideas within paragraphs in written documents.
5. compile samples of original business documents based on given scenarios.
6. create the appropriate business document for formal business meetings using the appropriate format, content, and tone.
7. prepare and produce the appropriate documents for internal communication.

8. construct different forms capable of capturing specific information.
9. write press releases using the five "Ws (who, what, why, when, where).
10. identify the different types of résumés.
11. create a combination résumé.
12. use electronic means to generate business documents.
13. compose reports using appropriate format, content, and tone.
14. compose the reports appropriate to the given situation.

Content:

1. Letters:
   a. Definition of the business letter.
   b. Purpose of the business letter.
   c. Parts of the business letter – heading, inside address, salutation, body etc.
   d. Types of business letters - complaint, adjustment, request, application.
   e. Identify the four basic types of résumés (chronological, functional, targeted resume and combination résumé.

2. Résumé**:**
   a. What is a résumé?
   b. Types of resumes identify the four basic types of résumés (chronological, functional, targeted resume and combination résumé.
   c. Parts of a résumé.
   d. Characteristics of a résumé.

3. Memorandum:
   a. What is a memorandum?
   b. Memorandum guidelines.
   c. Purpose of the memorandum.
   d. Parts of the memorandum.

4. Minutes:
   a. What are minutes?
   b. Forms of minutes: resolution, narrative, and action minutes.
   c. Parts of minutes.
   d. How to take business minutes.

5. Agenda:
   a. What is an agenda?
   b. Parts of the agenda

6. Notice:
   a. What is a notice?

7. Press release:
    a. What is a press release?
    b. How is a press release used?
    c. Press release components – embargo date, contact information, heading etc.

8. Form Design:
    a. What is a form?
    b. Requirements of form design.
    c. Good principles of form design.
    d. Layout.

9. Types of Computerized telecommunication:
    a. Video Calling.
    b. Video Conferencing.
    c. E-mail.
    d. Social Networks.
    e. Fax.
    f. Text messaging/ instant messaging.
    g. Teleconferencing.

10. Report:
    a. What is a report?
    b. Types – Formal and Informal.
    c. Format Guidelines.
    d. Planning the report.
    e. Drafting report content/text:
        i. Report Introduction.
        ii. Report Body.
        iii. Report Close.
    f. Writing Reports.
        i. Adapting to your audience.
        ii. Examining style and tone.
        iii. Maintaining consistent structure/format.

METHODS OF DELIVERY:

1. Lectures
2. Work sheets
3. Audio and tape evaluations
4. Discussions
5. Peer conferencing
6. Presentation(s)
7. Research
8. Role Play
9. Simulation

METHODS OF ASSESSMENT AND EVALUATION:

1. Common Courseworks: 40%
    a. In class test 5%
    b. Midterm test 20%
    c. Project (individual) 15%
2. Final Examination (2 hours) 60%

FINAL EXAMINATION

SECTION A 25 Multiple Choice Questions.

SECTION B Produce three (3) Business documents.

NB. The Format of Resume taught in this course is to be used when conducting Work Experience. Documents tested in common coursework should not be tested in final exam.

THE COUNCIL OF COMMUNITY COLLEGES OF JAMAICA

COURSE NAME:	Computer Organization and Architecture
COURSE CODE:	IARC2001
CREDITS:	3
CONTACT HOURS:	45 (45 hours theory)
PRE-REQUISITE(S):	None
CO-REQUISITE(S):	None
SEMESTER:	

COURSE DESCRIPTION:

This course introduces the computer hardware and provides opportunities for analysis and evaluation of their interaction and organization. It emphasizes key concepts and hardware processes such as computer architecture, central processing unit, instruction sets and assembly, computer logic and arithmetic, memory systems, pipelining, microprogramming, multicycling, parallelism, interfacing, peripherals, multiprocessors, and modern computer architectures.

COURSE RATIONALE:

Today, there is a proliferation of computer hardware that are in use in every aspect of modern society. Hence the need for the ICT student to engage in deep study of the components of computer hardware and their interactions, as well as the technological principles that are driving computer hardware development.

COURSE OUTCOMES:

Upon successful completion of this course, learners will be able to:

1. explain the operating principles, capabilities, and limitations of digital computers.
2. describe the major components and devices of a digital computer.
3. explain the importance of the processor unit.
4. apply computer architecture principles in digital computer design.

UNIT I – Digital Circuits (10 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. convert between decimal, octal, hexadecimal, and binary.
2. perform arithmetic in different number systems.
3. use radix and diminished radix complements in the proper scenarios.
4. explain information representation and text codes.
5. identify the characteristics of digital logic gates.
6. implement the logic gates in digital logic circuits.
7. explain Boolean expressions in their canonical and standard forms.
8. use Boolean algebra and Karnaugh Maps to simplify Boolean functions.
9. discuss and design logic circuits.

Content:

1. Number systems – number base conversion, complements.
2. Alphanumeric Codes - ASCII, EBCDIC, BCD.
3. Binary Logic and Logic Gates – AND, OR, NOT, NAND, NOR (introduce XOR and XNOR).
4. Boolean Algebra – 2 and 3 variables, simplification, truth tables.
5. Canonical and standard form.
6. Karnaugh Map Simplification and Manipulation –3 and 4 variables.

UNIT II – Combinational Circuits (5 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. use procedures to design combinational circuits.
2. analyze and design the make-up of several of digital components such as adders, decoders, encoders, and multiplexers.

Content:

1. Integrated Circuits – Definition.
2. Analysis and design procedures used for:
   a. Arithmetic circuits - (full adder, half adder and ripple adder)
   b. Decoders and Encoders
   c. Multiplexors

UNIT III – Sequential Logic Circuits (10 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. describe the structure of various types of flip-flops and outline their uses.
2. outline formal procedures for the analysis and design of sequential circuits.
3. differentiate among types of memory.
4. construct large capacity memory by combining smaller RAM chips.
5. examine the design of various digital components such as registers, counters, and memory devices.
6. describe the design and operation of registers, counters, and memory devices.
7. explain the significance of the bus width, address bus, data bus and control bus.

Content:

1. Flip-Flops - (R/S Flip Flop, D Flip-Flop, JK Flip-Flop, T Flip-Flop).
2. Registers - Design & Operation, Register Transfer.
3. Memory Systems/Devices:
   a. Memory Hierarchy and Organization.
   b. Types of Memory:
      i. RAM and ROM
      ii. DRAM and SRAM
      i. PROM, EPROM, EEPROM
      ii. Cache memory
      iii. Virtual memory
4. Bus width – address bus, data bus, control bus.

UNIT IV – The Processor Unit (5 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. differentiate between the architectures of various microprocessors (8086 to present).
2. describe the components used in a microprocessor.
3. identify the basic components of simple microcomputers.
4. describe the design of a CPU including data path and control unit.

Content:

1. Main Components (ALU and CU):
   a. Architectures (8086 to present) – history and evolution, fundamentals of design, performance metrics.

2. Arithmetic Logic Shift Unit:
   a. Processor Unit
   b. Instruction formats

3. Micro-instruction format :
   a. Micro program for computer cycle
   b. Micro program routines
   c. Control unit operations
   d. Datapaths
   e. Multiprogramming
   f. Multicycling
   g. Pipelining
   h. Data Hazards, Forward and Stalls

4. Basic architecture of a typical microprocessor.

UNIT V – Computer Instructions and Addressing Mode (5 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. describe the different types of instruction set architectures.
2. interpret the different parts of a computer instruction.
3. demonstrate the use of computer instructions for the following: arithmetic operations, addressing modes, memory locations or offset.
4. explain the program control instructions.
5. outline the various interrupts within a computer.
6. differentiate between immediate, direct, indirect, index and relative addressing.
7. define a stack.
8. describe the basic operations of a stack.
9. describe the basic data transfer methods.
10. state what is the importance of floating-point operations (IEEE standard).

Content:

1. Instruction set architectures.

2. Computer Instructions and Addressing Modes:
    a. Arithmetic operations
    b. Memory locations
    c. Offset
    d. Addressing modes
    e. Assembly
3. Address field and Modes.
4. Stack Organization.
5. Data Transfer and Manipulation.
6. Floating Point operations.
7. Program control instructions and interrupts.

UNIT VI - Interfacing Peripherals (3 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. explain the different types of i/o.
2. describe measures for i/o performance.
3. connect peripherals via buses.

Content:

1. I/O Types.
2. Measures for I/O Performance.
3. Connecting Peripherals via Buses.
4. Interfacing Peripherals with the CPU and Operating System.

UNIT VII – Multiprocessors (2 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will able to:

1. explain how to program multiprocessors.
2. describe the bus connection for multiprocessors.
3. explain clusters.

Content:

1. Programming Multiprocessors.
2. Bus Connection.
3. Clusters.

UNIT VIII - Special Topics (selective) (2 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. discuss various topics related to computer organization and architecture.

Content:

1. Instruction-level Parallelism.
2. Memory Hierarchy Design.
3. Thread-level Parallelism.
4. Emerging trends in computer organization and architecture.

METHODS OF DELIVERY:

1. Lectures
2. Tutorial
3. Discussions
4. Case studies
5. Presentations
6. Demonstrations
7. Guided Practice
8. Group Work
9. Lab work
10. Independent Work

METHODS OF ASSESSMENT AND EVALUATION:

1.	Common Coursework	20%
2.	Internal Tests and assignments	20%
3.	Lab work	20%
4.	Midterm	10%
5.	Final Examination	30% (Unit VIII not to be tested)

RESOURCE MATERIAL:

Prescribed:

Carpinelli, J. (2000). *Computer systems organization & Architecture*. Boston, MA: Addison-Wesley.

Mano Morris, M., & Ciletti M. (2007) *Digital design,* (4th ed.). NJ: Prentice Hall.

Stallings, W., (2009) *Computer organization and architecture – designing for performance,* (8th ed.). NJ: Prentice Hall.

Recommended:

Comer, D. E., (2004) *Essentials of computer architecture* (2nd ed.). NJ: Prentice Hall.

Hennessy, J., & Patterson, D. (2003). *Computer architecture: A quantitative approach* (3rd ed.). San Francisco, A: Morgan Kaufmann Publishers.

Shiva, S., (2007) *Computer organization, design, and architecture* (4th ed.). FL: CRC Press.

Mano Morris, M., (1993). Computer systems architecture. (3rded.) NJ: Prentice Hall.

Tanenbaum, A. (1998). *Structured computer organization* (4th ed.). Upper Saddle River, New Jersey: Prentice-Hall.

Williams, R. (2001). *Computer systems architecture: A networking approach*. Boston, MA: Addison-Wesley, 2001.

Adapted

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THE COUNCIL OF COMMUNITY COLLEGES OF JAMAICA

COURSE NAME:	Computer Programming I – (C# OOP and DB)
COURSE CODE:	CPRG1205
CREDITS:	3
CONTACT HOURS:	105 (15 hours theory, 90 hours practical)
PRE-REQUISITE(S):	Introduction to Programming (CPRG1101)
CO-REQUISITE(S):	None
SEMESTER:	

COURSE RATIONALE:

The use of the object-oriented programming paradigm is prevalent in the computing industry and therefore a grasp of the principles of this paradigm is critical. The use of the C# language is also prevalent in industry and shall be used to facilitate the concretization of the object-oriented principles.

COURSE DESCRIPTION:

This course is designed to give the learner a working knowledge of the principles of object-oriented programming. It is also intended to provide learners with the knowledge needed to craft object-oriented solutions to problems and to implement the solutions using C#. Topics covered will include Concepts, Operators, Classes, Overloading, Inheritance (abstraction), and Exception Handling. The course also includes producing GUI applications to manipulate databases.

COURSE OUTCOMES:

Upon successful completion of this course, learners will be able to:

1. demonstrate various object-oriented programming concepts.
2. demonstrate the creation of classes in C#.
3. demonstrate the concept of inheritance in C#.
4. explain the importance of Exception Handling techniques.
5. explain the concept of overloading.
6. explain appropriate GUI components to solve real world problems.
7. demonstrate the manipulation of databases.

UNIT I – C# Object Oriented Programming (7 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. define the term 'Object-oriented programming'.
2. describe key concepts of Object-oriented programming.
3. discuss the benefits of Object-oriented Programming.

Content:

1. Object-Oriented Programming definition.
2. Key concepts of object-oriented Programming.
   a. Encapsulation
   b. Information hiding
   c. Abstraction
   d. Inheritance
3. Benefits of Object-Oriented programming.
   a. Reuse of Code
   b. Reduction of errors
   c. Faster application development

UNIT II – Classes (21 hours)

Learner Outcomes:

Upon the successful completion of this unit, learners will be able to:

1. create a class.
2. explain class scope.
3. describe the three (3) levels of access control.
4. explain the modifiers static and constant as used with class members.
5. define constructors in C#.
6. explain the purpose of constructors.
7. explain the purpose of destructors.
8. define class methods in C#.
9. create properties.
10. instantiate objects in C#.

11. explain composition.
12. define classes that use composition.
13. manipulate classes data using composition.

Content:

1. Create a class by demonstrating class scope.
2. Class definition - data members and methods.
3. Access control (private, protected, public).
4. Class data members – automatic, static, constant.
5. Constructors (default, parameterized, static).
6. Constructor - initialize data members.
7. Destructor - release resources.
8. Class methods – constant, static, non-static.
9. Properties - Accessors (get, set).
10. Object instantiation – constant and regular.
11. Composition - class that is a reference to object(s) of other class.
12. Create classes requiring composition.
13. Accessing data members of classes with composition.

UNIT III – Reusing Code through Inheritance (21 hours)

Learner Outcomes:

Upon the successful completion of this unit, leaners will be able to:

1. explain the importance of inheritance in OOP.
2. define the basic terms.
3. describe protected access.
4. explain the different types of inheritance.
5. implement inheritance in C#.
6. implement the different types of inheritance.
7. override base class functions in derived classes in C#.
8. distinguish between concrete and abstract classes.
9. implement abstract classes in C#.
10. implement polymorphism.

Content:

1. Introduction to Inheritance.
2. Basic terminology – *base class, derived class, polymorphism*.
3. Protected access.
4. Direct single, hierarchical, indirect/multilevel inheritance.
5. Create base and derived classes, constructor, and destructor in derived class.
6. Create single, hierarchical, indirect/multilevel inheritance.
7. Re-defining base-class members in derived classes, virtual functions.
8. Abstract and Concrete classes.
9. Create abstract classes, abstract methods, override.
10. Method overloading, static polymorphism.

UNIT IV – Exception Handling (10 hours)

Learner Outcomes:

Upon the successful completion of this unit, learners will be able to:

1. explain the importance of exception handling.
2. explain the structural components of exception handling in C#.
   a. Try blocks
   b. Throw statements
   c. Catch blocks
3. implement exception handling in C#.

Content:

1. Introduction to exception handling.
2. Try blocks.
3. Throwing an exception.
4. Catching, handling, and re-throwing an exception.

UNIT V – Operator Overloading (7 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. explain operator overloading.
2. implement operator overloading for unary operators as class members.

3. implement operator overloading for binary operators as class members.

Content:

1. purpose of operator overloading.
2. overload unary operator as class members ++, --, true, false.
3. overload binary operator as class members – mathematical and comparison operators.

UNIT VI – GUI Components (21 hours)

Learner Outcomes:

Upon successful completion of this unit, leaners will be able to:

1. choose appropriate GUI elements based on user criteria.
2. configure common GUI attributes.
3. code common GUI elements for user interface functionality.
4. create event driven GUI.

Content:

1. Form, Label, TextBox, Button, RadioButton, CheckBox, ListBox, GroupBox, ComboBox, PictureBox, DateTimePicker, Timer, Panel, menu, mdicontainer.
2. Attributes: Text, Name, Visible, Enabled, Checked, SelectedIndex, SelectedItem, Count, Clear, PasswordChar, MultiLine, BackColor, ForeColor, WindowState.
3. Code GUI elements to create functional user interfaces.
4. Events: Load, Click, TextChange, MouseEvent, KeyboardEvents.

UNIT VII – Using Databases (18 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to use ADO.net class to:

1. connect to available databases.
2. update the content of the database.
3. extract records from the database.
4. display information from the database.

Content:

1. ADO.net objects – connection, dataReader, command, dataset, dataAdapter, DataGrid, Binding Source, Binding Navigator.
2. SQL statements - insert, delete, update.
3. SQL Select statement, *, row(s), column(s), Where Statement.
4. Use DataGrid to display information from a database.

METHODS OF DELIVERY:

1. Lecture/Tutorial
2. Practical demonstrations
3. Practice sessions
4. Demonstration
5. Research
6. Lab work
7. Discussion
8. Projects
9. Simulation

METHODS OF ASSESSMENT AND EVALUATION:

1. Common Course Work	40%
2. Internal Course Work	20%
3. Final Exam	40%

(25 MCQs 1 mark each and 5 ETQs 25 marks each to choose 3)

RESOURCE MATERIALS:

Prescribed:

Deitel and Deitel, (2010). C# 2010 for Programmers 4th Edition, Pearson Education, Inc.

Recommended:

Bell, D., Parr M. (2009). C# for learners, Revised Edition, Pearson Education.

Gaddis, D. (2010). Starting Out With Visual C# Second Edition, Pearson Education.

Mayo.J. (2008). Sams.C.Sharp 3.0.Unleashed.With.the.dot.NET.Framework.3.5.

Other online resources:

https://www.ebscohost.com

www.springerlink.com/books

THE COUNCIL OF COMMUNITY COLLEGES OF JAMAICA

COURSE NAME:	Database Management
COURSE CODE:	CSYS2404
CREDITS:	3
CONTACT HOURS:	45 (45 hours theory)
PRE-REQUISITE(S):	None
CO-REQUISITE(S):	None
SEMESTER:	

COURSE DESCRIPTION:

Learners will be exposed to database concepts including functional dependencies, SQL, and normalization. Emphasis will be placed on the creation and manipulation of databases using Oracle, but this can be extended to any available DBMS.

GENERAL OBJECTIVES:

Upon successful completion of this course, learners will be able to:

1. explain database management principles.
2. describe database design process.
3. create and manipulate databases.
4. explain Distributed Database, Business Intelligence and Big Data concepts.

UNIT I – Introduction of Database Concepts (7 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. define key terms associated with database management.
2. differentiate between the file oriented and the database approach.
3. explain the advantages associated with database approach as opposed to file-oriented approach.
4. identify hardware, software, and DBMS components.

5. describe features of hierarchical, network, relational, object-oriented, object-relational, and multi- dimensional models.
6. list five (5) popular DBMSes.
7. explain functions common to most DBMSes.

Content:

1. Basic Concepts – character, field/column, record/row/tuple, table, file, database, Database Management System, primary key, foreign key, secondary key, composite key, super key, candidate key, index key, structural dependence, data dependence, structural independence, data independence.

2. The traditional/file-oriented approach.

3. The database approach.

4. Advantages of databases.

5. Examples of popular DBMSes.

6. Functions common to most DBMSes – File retrieval and maintenance, data manipulation, query language, forms, reports, data security, backup, and recovery.

7. Components of a DBMS – DDL, DML, Query Language, Report Generator.
8. The different types of databases – hierarchical, network, relational, object-oriented, object-relational, multi-dimensional.

UNIT II – Database Design (12 hour)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. define the 'Database System Life Cycle'.
2. identify the Phases in the Database System Life Cycle.
3. identify the roles of database personnel.
4. describe conceptual, logical, and physical data design.
5. explain the concept of database schema.
6. use standard notation to illustrate a table structure.
7. utilize ERDs to capture data requirements.
8. identify the role of the Data Dictionary.
9. explain concepts of entity and referential integrity.

10. explain Functional Dependencies (FDs).
11. describe Armstrong's axioms.
12. use Armstrong's axioms to come up with other FDs.
13. normalize to 3NF.
14. assess file layouts as they affect the functioning of databases.
15. differentiate between physical and logical data organization.

Content:

1. The Database System Life Cycle - Database Analysis, Database Design, Database Implementation, Database Testing and Evaluation, Operation, Database Maintenance.
2. Roles of database personnel - Data modelers, Business Analysts, Database Designers, Systems Analysts, Programmers and Database Administrators.
3. Database Design – Conceptual, Logical, Physical.
4. Database Schema – Conceptual, Internal, External, Physical.
5. Standard notation.
6. Entity- Relationship Diagrams.
7. Role of the Data Dictionary.
8. Entity and Referential Integrity.
9. Functional Dependencies.
10. Armstrong's Axioms – reflexivity, augmentation, transitivity, union, decomposition, pseudo transitivity.
11. 1^{st} , 2^{nd} , 3^{rd} Normal Forms.
12. Assessment of file layouts as they affect the functioning of a database – sequential, random, indexed.
13. Physical and logical data organization.

UNIT III – Introduction to Relational Algebra and SQL(15 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. identify the role of Relational DMLs and DDLs.
2. differentiate between relational algebra and relational calculus.
3. solve Relational Algebra problems.
4. list the categories of SQL commands.
5. utilize SQL commands.

Content:

1. The role of Relational DMLs and DDLs.

2. The difference between relational algebra and relational calculus.

3. Introduction to Relational algebra – Simple projection, selection, difference, renaming, union, intersection, division, join (natural, equi, inner, outer) and Cartesian product.

4. Categories of SQL commands – DDL, DML, SQL/PSM, TCL, DCL.

5. SQL Commands - CREATE TABLE (using constraints – primary key, foreign key, data validation - CHECK), ALTER TABLE, INSERT, SELECT (using DISTINCT, WHERE, GROUP BY,ORDER BY, HAVING, aggregate functions- count, sum, min, max, avg, logical operators- and/or, comparison operators- in, between, like, not, =, >, <), SELECT sub queries, UPDATE, DELETE, CREATE VIEW, CREATE INDEX, DROP TABLE, DROP VIEW, DROP INDEX, CREATE ROLE, GRANT and REVOKE, COMMIT and ROLLBACK.

UNIT IV – Distributed Databases, Business Intelligence and Big Data (8 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. define characteristics of Distributed Databases.
2. assessment of a distributed database versus a loose connection of independent sites.
3. define terms and concepts used in the distributed database environment.
4. identify advantages and disadvantages of distributed databases.
5. discuss data warehousing.
6. differentiate between a data warehouse and a data mart.
7. differentiate between a data warehouse and an operational database.
8. describe Business Intelligence (BI) systems.
9. differentiate between BI systems and Transaction Processing systems (TPS).
10. explain the different categories of BI systems.
11. discuss On-line analytical processing (OLAP).
12. conduct analysis on data in an Excel file.
13. discuss the concept of transactions and concurrency control.
14. discuss the concept of data mining.
15. explain the concept of Big Data.
16. explain how NOSQL relates to Big Data.
17. list examples of NOSQL databases.

Content:

1. Characteristics of a distributed database.

2. Definition of logical database, local and global application, global intelligence.
3. Assessment of a distributed database versus a loose connection of independent site.
4. Terms and concepts used in distributed databases – transparency, homogeneous versus heterogeneous distribution, fragmentation – vertical/horizontal, replication, and allocation.
5. Advantages and disadvantages of a distributed database.
6. Data warehouse (DW).
7. Data mart.
8. Differences between data warehouse and operational database.
9. Business Intelligence (BI) applications – OLAP, DW.
10. Analysis of data by creating graphs in Excel.
11. Business Intelligence (BI) systems vs Transaction Processing systems.
12. Categories of BI systems – reporting systems, data mining apps.
13. Transactions – Atomic, Consistent, Isolated, Durable (ACID).
14. Concurrency control.
15. Data mining.
16. Big Data.
17. NOSQL relation to Big Data.
18. Examples of NOSQL databases.

UNIT V– Emerging Trends in Database Management (2 hours)

This unit is not to be tested on the final exam.

Upon successful completion of this unit, learners will be able to:

Learner Outcomes:

1. list examples of the latest DBMSes.
2. discuss emerging database models.
3. describe the features of emerging database tools.

Content:

1. Examples of the latest DBMSes.
2. Emerging database models.
3. Emerging database tools.

METHODS OF DELIVERY:

1. Lectures
2. Discussions
3. Lab

4. Research
5. Demonstrations
6. Presentations
7. Individual/group projects

METHODS OF ASSESSMENT AND EVALUATION:

1.	Common Coursework	
a.	Design a normalized database for a business system	10%
b.	Create SQL commands for the database	15%
2.	Internal Test	10%
3.	Presentation of Research on emerging trends in database management	10%
4.	Analysis of data exercise	5%
5.	Final Examination	50%

(20 MCQs and 2 questions to choose from 4 – Compulsory question on Unit 3)
(Emerging Trends are NOT to be tested)

RESOURCE MATERIAL:

Prescribed:

Connolly, T., Begg, C. (2014). Database Systems: A Practical Approach to Design, Implementation, and Management (6th Ed). Addison-Wesley.

Recommended:

Date, C. J., (2003) An introduction to database systems. (8th ed.). NJ: Addison Wesley.

Elmasri, R & Navathe, S. (2007) Fundamentals of database systems (5th ed.). NJ: Prentice Hall.

Hoffer, J.A., Prescott, M., & Topi, H., (2012) Modern database management. (11th ed.). NJ: Prentice Hall.

Shah, N., (2004) Database systems using oracle. (2nd ed.). NJ: Prentice Hall.

Online resources:

https://www.**ebscohost**.com

www.springerlink.com/books

THE COUNCIL OF COMMUNITY COLLEGES OF JAMAICA

COURSE NAME:	Discrete Mathematics and Algebra
COURSE CODE:	MATH1103
CREDITS:	4
CONTACT HOURS:	60 (60 hours theory)
PRE-REQUISITE(S):	None
CO-REQUISITE(S):	FCM 1 (can be exempted if they have a passed CSEC Maths)
SEMESTER:	

COURSE DESCRIPTION:

This course equips learners with the relevant mathematical concepts and methods required for adequately undertaking courses in data processing management techniques and related areas. It aims to advance learner's appreciation of and abilities in the use of mathematics as a precise model of thought and communication as well as a tool for modelling various problem situations arising in data processing and the business world at large.

COURSE OUTCOMES:

Upon successful completion of this course, learners will be able to:

1. apply different number systems together with their conversion from one system to the other.
2. appreciate the process of logical reasoning and apply same to problem solving.
3. apply the principle of reasoning to validate hypotheses.
4. explain graphical techniques for solving problems and interpret the results.
5. use mathematical models to represent and solve real life problems.
6. use technology to solve mathematics and algebra problems.

UNIT I - Computer Arithmetic (6 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. identify the various number systems.
2. convert from one number system to another and perform the arithmetic operations (addition, subtraction, and multiplication).
3. represent numbers in fractional form together with the conversion into other number systems
4. be able to recognize the errors in computing.

Content:

1. Number systems - binary, decimal, octal and hexadecimal.
2. Conversion between the number systems.
3. Representation of numbers in various forms including fractional forms:
   a. Fixed and
   b. Floating point
4. Errors in computing.

UNIT II - Set Theory (6 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. define a ‘set’ and ‘set terminologies’.
2. represent a set using set builder notation, listing or description and Venn diagram.
3. recognize different types of sets.
4. perform set operations.
5. draw Venn diagrams and compute relevant information.
6. list the number of subsets of a particular set and validate using the formula $n(s) = 2^{\circ}$.

Content:

1. Definition of sets and the following terms: finite sets, infinite sets, equality of sets.
2. Representation.

3. Recognition of universal set, empty set, subsets etc.
4. Operation of sets: union, intersection, complement, etc.
5. Venn diagram and computations.
6. Evaluation of the number of subsets.

UNIT III - Logic and Proofs (8 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. identify and state proposition.
2. construct truth tables.
3. explain and apply quantifiers.
4. explain and apply the law of Syllogism.
5. use the rules of logic to prove by induction or contradiction, conditional and bi-conditional proposition.
6. apply De Morgan's law to set operations.

Content:

1. Identification of negation, conjunction, disjunction.
2. Construct truth tables using the notations above.
3. Qualifier- existential and universal.
4. Proof by induction and contradiction.

UNIT IV - Matrices (8 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. classify matrices - column vectors, row vectors, null matrices, square matrices, etc.
2. perform matrix operations on 3 x 3 matrices: addition, subtraction, multiplication, and transposition.
3. compute the determinant, adjoint and inverse of a matrices.
4. solve a system of linear simultaneous equations.
5. interpret and translate worded questions that may be represented in matrix form as $AX = B$.

Content:

1. Classification of matrices.
2. Matrix operations.
3. Computation of determinants, the adjoint or inverse matrices, and transposition of a matrix.
4. Solution of linear simultaneous equations using.
   a. Cramer's rule
   b. Abjugate method
   c. Gauss-Jordan method (Row operations)
5. Interpretation and evaluation of practical problems.

UNIT V - Exponents and Logarithms (5 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. define an Exponent and Logarithm.
2. state the laws of Indices and Logarithm.
3. use the laws of Indices and Logarithm to simplify expressions.
4. write logarithms in exponential form and vice-versa.
5. solve exponential equations when bases can be equated.
6. solve exponential equations when bases cannot be equated.
7. solve simple logarithmic equations.

Content:

1. $a^x = p$, where $a \in R, x \in Q \; and \; P > 0$
2. Laws of Indices and Logarithms
3. $a^x = p \leftrightarrow \log_a p = x$
4. Simplify expression using the laws of Indices and Logarithm
5. Solve equations of the form $a^x = a^y \rightarrow x = y$
6. Solve equations of the form $a^x = b^y \rightarrow \log a^x = \log b^y$
7. Solve equations of the form $\log_2 a + \log_2 b = 3 \rightarrow \log_2 ab = \log_2 2^3$

UNIT VI - Relations (9 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. determine sets of ordered pairs and product sets.

2. be able to construct tree diagrams.
3. identify equivalences relations, is: reflexive, symmetric and transitive relations.
4. identify, define, and solve problems involving recurrence relations.

Content:

1. Determination of ordered pairs.
2. Construction of tree diagram (binary trees).
3. Equivalence relation:
   a. Symmetric
   b. Reflexive
   c. Transitive
4. Recurrence relations.

UNIT VII - Algorithms and Counting Methods (10 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. identify notations for algorithms.
2. analyze the complexity of algorithms.
3. compute the greatest common divisor using the Euclidean algorithm.
4. define and evaluate permutations and combinations.
5. formulate algorithms for generating permutations and combinations.
6. calculate binomial coefficients using combinations.
7. use the method of Mathematical Induction to prove hypotheses.
8. use recurrence relations to analyze the time required by algorithms such as binary search and merge sort.

Content:

1. Identification of algorithms.
2. Analysis of algorithms.
3. Euclidean algorithm.
4. Algorithm pertaining to Permutations and Combinations.
5. Evaluation of binomial coefficients.
6. Recurrence relations.

7. Proof by Mathematical Induction:
   a. Divisibility of expressions
   b. Validity of summation formula for series.

UNIT VIII - Functions and Graphs (5 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. draw the graph of linear, polynomial, exponential and logarithmic functions.
2. calculate the gradient and intercepts of graphs of linear functions.
3. interpret the gradient of given functions.
4. determine if a function is increasing or decreasing.

Content:

1. Graphing Linear ($y = mx + c$), Polynomial (up to degree $n = 3$), Exponential ($y = a^x$) and Logarithmic ($y = \log_b X$) functions.

2. For ($y = mx + c$) or ($ax + by = c$), they- intercept is when x = 0, and the x - intercept is when $y = 0$
3. Gradient of a Linear Function $= \frac{increase\ in\ y}{increase\ in\ x} = \frac{Vertical\ distance}{Horizontal\ distance}$
4. Positive Gradient denotes an increasing function while a negative gradient denotes a decreasing function

METHODS OF DELIVERY:

1. Lectures
2. Demonstrations
3. Individual work
4. Discussions
5. Research
6. Problem solving

METHODS OF ASSESSMENT AND EVALUATION:

1. Common Coursework 20%
2. Two Internal Tests 20%
3. Final Examination 60%

(30 MCQ's (1 mark each) and 4 Structured Questions to choose any 2 (25 marks each))

RESOURCE MATERIAL:

Prescribed:

Johnson Baugh, R. (2008). Discrete mathematics. (7th ed.). NJ: Prentice Hall.

Spiegel, M. & Moyer, R. (2014). Schaum's Outline of College Algebra. (4th Ed). Schaum's Outline Series).

Recommended:

Lipschutz, S. & Lipson, M. (2007) Schaum 's outline of discrete mathematics. (Schaum's outline series) (3rd ed.). OH: McGraw Hill.

Kolman, B., Dusby, R., & Ross, S.C. (2009). Discrete mathematical structures. (6th ed.). NJ: Prentice Hall.

Web Resource:

www.mathworks.com

www.khanacademy.org

Other online resources:

https://www.ebscohost.com

www.springerlink.com/books

THE COUNCIL OF COMMUNITY COLLEGES OF LAMAICA

COURSE NAME:	Fundamentals of Data and Algorithm Analysis
COURSE CODE:	IDAA2001
CREDITS:	3
CONTACT HOURS:	45 hours
PRE-REQUISITE(S):	Introduction to Programming
CO-REQUISITE(S):	
SEMESTER:	

COURSE DESCRIPTION:

This course builds upon the work completed Introduction to Programming to introduce the fundamental concepts of data structures and the algorithms that proceed from them. It focuses on recursion, the underlying philosophy of object-oriented programming, fundamental data structures (such as queues, stacks, linked lists, hash tables, trees, and graphs), sorting and searching techniques, and the basics of algorithmic analysis. Labs provide hands-on programming experience that is vital for beginning programmers and computer science students.

COURSE RATIONALE:

Computers have entered most fields of human activity as tools for storing and processing information. Contrary to popular belief, computers do not solve problems independently neither do they operate by themselves. They need to be programmed in order for them to function properly. This course teaches the different steps involved in creating programs and the basic concepts in program development. It focuses on different data types and fundamental programming techniques. Furthermore, the need for several ways of proving program correctness is also addressed.

COURSE OUTCOMES:

Upon successful completion of this course, learners will be able to:

1. explain the concept of data types and ADTs.
2. explain how to implement and use ADTs to solve problems.
3. explain how to analyze algorithm complexity.
4. explain how to prove the correctness of a program.

UNIT I - ADT List and Introduction to Algorithm Analysis (6 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. define basic terms in data structures.
2. select appropriate data types given a problem statement.
3. define the concept of an abstract data type (ADT).
4. implement and use ADTs to solve problems.
5. define algorithm and algorithm analysis.
6. explain the benefit of algorithm analysis.
7. differentiate between the different types of analysis.
8. analyze algorithm complexity concepts.

Content:

1. Terms – data, information, type, data item, data type, abstraction, information hiding, encapsulation, abstract data type, algorithm, algorithm analysis, file structure.
2. ADTs for lists, stacks, and queues.
3. Types of analysis – worst case, average case, best case, probabilistic case.
4. Time complexity, Space complexity.

UNIT II - Pointers, Linked List, dynamic data (3 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. explain the concepts of pointers, linked lists, and dynamic data.
2. implement pointers, linked lists, and dynamic data structures to solve problems.

Content:

1. Pointers.
2. Linked lists (single, double, circular, double circular).
3. Dynamic data structures.

UNIT III - Inheritance (6 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. explain the concept of inheritance.
2. create programs using operator overloading, constructors, copy constructor, destructor, dynamic memory structures, and inheritance of class methods.

Content:

1. Inheritance.
2. Implementation of inheritance.

UNIT IV - Stack (2 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. explain the concept of a stack.
2. implementation of a stack.

Content:

1. Stack – definition (LIFO), create, push, pop.

UNIT V - Queue (2 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. explain the concept of a queue.
2. implementation of a queue.

Content:

1. Queue – definition (FIFO), create, insert, remove.
2. Queue-Simulation.

UNIT VI - Sorting algorithms (4 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. explain different sorting algorithms.
2. determine the running time and space complexity of the different algorithms.
3. compare the efficiency of the different sorting algorithms.
4. implement the sorting algorithms as well-structured programs.

Content:

1. Sorting algorithms – selection sort, insertion sort, bubble sort.
2. Sort/Efficiency – running time and space complexity.

UNIT VII - Binary Search Tree (3 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. discuss various tree terminologies.
2. explain the concepts of a binary search tree.
3. show what a binary search tree looks like after a series of insertions and deletions.
4. show the output of a traversal algorithm on a binary search tree.
5. create a binary search tree that can hold a set of records.
6. implement operations on a binary search tree.

Content:

1. Terminologies - Node, internal node, edge, root, parent, child, ancestor, descendant, subtree, level, height, full binary tree, complete binary tree, binary tree, binary search tree.
2. Binary search tree – insertion and deletion.
3. Inorder, preorder, postorder operations on a binary search tree.

UNIT VIII - Recursive techniques (6 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. differentiate between recursion and iteration.
2. use recursion to implement traversal algorithms.
3. analyze recursive algorithms.
4. design algorithms for problems requiring recursive and non-recursive solutions.

Content:

1. Recursion.
2. Towers of Hanoi.
3. Recursive algorithms – merge sort, quick sort (running time and space complexity).

UNIT IX - File Management (4 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. explain the data hierarchy.
2. give reasons for creating a file.
3. classify files by usage.
4. describe file access modes.
5. discuss the advantages and disadvantages of variable length and fixed length records.
6. discuss the operation of file structures.
7. implement sequential and relative files.
8. create programs that use files.

Content:

1. Data hierarchy – bit, byte, word, field, record, file, dataset, database.
2. File classification and usage – master, transaction, report, work, program.
3. File access modes – input, output, input/output.
4. Advantages and disadvantages of variable length and fixed length records.
5. File structures – sequential, relative, indexed sequential, multikey.

UNIT X – Correctness of a program (6 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. prove the correctness of a program.

Content;

1. Introduction to correctness proofs – definition, methodology.

2. Application of correctness proofs on simple algorithms – with sequence control structures only, with selection control structures, with iterative control structures (one loop only).

METHODS OF DELIVERY:

To facilitate fulfillment of the requirements of this course, the teaching and learning sessions will utilize the following approaches:

1. Demonstrations
2. Guided Practice
3. Group Work
4. Independent Lab work
5. Independent Work
6. Research

METHODS OF ASSESSMENT AND EVALUATION:

In this course marks will be assigned as follows:

Coursework 60%
(Written papers and labs)

Examination 40%
(Mid-term 10%; Final 30%)

RESOURCE MATERIAL:

Prescribed

Johnson Baugh, R. & Schaefer, M. (2004). Algorithms. NJ; Prentice Hall.

McMillan, M. (2007) Data Structures and Algorithms Using C#. Cambridge University Press.

THE COUNCIL OF COMMUNITY COLLEGES OF JAMAICA

COURSE NAME:	Fundamentals of Information Technology
COURSE CODE:	ITEC1104
CREDITS:	3
CONTACT HOURS:	75 (30 hours theory, 45 hours practical)
PRE-REQUISITE(S):	None
CO-REQUISITE(S):	None
SEMESTER:	

COURSE RATIONALE:

To expose students to the fundamentals of Information Technology to enable functionality in the workspace which is now heavily reliant on technology.

COURSE DESCRIPTION:

This course is designed to provide learners with a comprehensive knowledge of the application of computers in different organizations. It includes a thorough introduction to computers and information technology, information systems, computer networks and systems security. It also aims at equipping learners with practical operating system, word processing, presentation, spreadsheet, database, and Internet search techniques skills.

COURSE OUTCOMES:

Upon successful completion of this unit, learners will be able to:

1. understand principles, trends, and ethical implications of Information Technology.
2. explain the various software and their functions.
3. explain data and types of information systems used in the business environment.
4. explain the concepts of database management systems.

5. explain the concepts of data communication and networking.
6. explain computer threats and countermeasures for networked computer systems.
7. explain sustainability issues related to technology.

UNIT I - Introduction to Computers and Information Technology (9 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. define information technology and computer system.
2. state benefits of Information Technology.
3. discuss the history of computers.
4. differentiate between categories of computers.
5. explain the purpose of components in the system unit.
6. select appropriate input, output and storage devices for a given situation.
7. explain the social, legal, ethical, and economic implications of information technology.
8. outline the health issues relating to the use of technology.
9. discuss emerging technologies.

Content:

1. Information technology and computer system definition.
2. Benefits of information technology - speed, consistency, reliability, communication, storage.
3. History: Generations (From the 0^{th} generation (abacus) to the present).
   a. description of technology used
   b. features
   c. time period of invention
   d. name of inventor
4. Categories Mainframe, Super, Microcomputer (mobile, personal), minicomputer/Midrange.
5. Components of the system unit:
   a. Memory RAM, ROM.
   b. CPU Parts and their functions (ALU, CU, register).
6. Select appropriate input, output and storage devices for a given situation.
   a. Storage devices: magnetic, optical, and flash drive.

b. Storage: Units of measurement for storage media bit, byte, KB, MB, GB, TB.
c. Input: Categories keyed (keyboard), pointing (mouse, trackpad, trackball, touchscreen, stylus, light pen), source data entry (scanner, barcode reader, OMR, OCR, MICR), multimedia (microphone, camera), biometric (fingerprint scanner, retinal scanner).
d. Output:
    i. Produces hard copy/Tangible output e.g. impact and non-impact printers.
    ii. Produces soft copy/Intangible output e.g. monitors, speakers, projectors
e. Input/output devices
f. Multi-functional devices.

7. Social, legal, ethical, and economic implications of the introduction of computer-based systems on individuals, organizations, and society.
    a. Social - social networks, netiquette.
    b. Legal - computer crime, identity theft, privacy, plagiarism, copyright infringement, libel.
    c. Ethical - academic integrity, software piracy, pornography, Ten Commandments for Computer Ethics (Computer Ethics Institute of the Brookings Institution).
    d. Economic - cost of access, virtual companies & taxation, job creation, job loss.

8. Health Issues and the environment:
    a. Ergonomics
        i. Common health issues e.g. Carpal Tunnel Syndrome.
        ii. Proper posture while using a computer.
        iii. Ergonomic devices e.g. keyboard, mouse.

9. State the long-term effect that technology has on the environment.
    a. Green Computing
        i. Energy Consumption of computers, Energy efficient computing, Renewable energy (- solar, wind etc.), Paperless office, Recycling.
        ii. Purpose of organizations such as Environmental Protection Agency (EPA).
        iii. Proper disposal of equipment.

10. Emerging Technologies (under three years old).

UNIT II - Software (3 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. define the term ‘software’.
2. distinguish between application software and system software.

3. classify an operating system and a utility programme.
4. list examples of operating system.
5. list categories of utility programmes.
6. explain the functions of an operating system.
7. discuss emerging technologies (software under three years old).

Content:

1. Definition: Software.
2. Distinguish: system software, application software.
3. Distinguish: utility and operating system.
4. Examples of operating systems: e.g. Unix, MS-Windows, DOS, Linux, Mac OS etc.
5. Categories utilities file compression, diagnostic, backup, anti-virus, disk cleaner etc.
6. Functions of an operating system-booting, user interface, resource management, managing memory, file management, task management etc.
7. Emerging technologies in software development.

UNIT III - Information Systems (5 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. distinguish between data and information.
2. explain the desired characteristics of information.
3. define Information Systems.
4. describe the features of the various information systems used at the various levels of an enterprise.
5. identify commonly used information systems that are used by functional units in a typical enterprise.

Content:

1. Definition of data and information.

2. Desired characteristics of information: accuracy; clarity; conciseness; user relatedness; relevance; timeliness.

3. Definition of Information Systems.

4. General systems: (definition, level, uses, inputs, outputs).
    a. Management Information System (MIS)
    b. Expert System (ES)
    c. Decision Support System (DSS)
    d. Transaction Processing System (TPS)
    e. Control and Monitoring System (CMS)
    f. Executive Information System (EIS)
    g. Knowledge Management System (KMS)
5. Commonly used information systems for functional units of an enterprise – definition.
    a. Human Resource
    b. Accounting/Finance
    c. Engineering and Product Development
    d. Sales and Marketing
    e. Distribution
    f. Customer Service

UNIT IV - Database Management Systems (2 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. explain the importance of database management systems (DBMS).
2. describe features common to most DBMS.

Content:

1. Importance of database management systems.
    a. Definition of database, DBMS.
    b. Examples of DBMSes Oracle, MySQL, MS-Access.
    c. Advantages less redundancy, easier and faster access, improved data integrity, security, availability, extensibility.
    d. Disadvantages, inconsistencies, complexity, breach of confidentiality.

2. Features common to most DBMSes:
    a. Table - character, field, data type, record, primary key.
    b. Forms, queries, reports.
    c. Backup.

UNIT V - Computer Networks (7 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. define ‘network’.
2. state the advantages and disadvantages of networks.
3. describe different types of network classifications.
4. identify the role of basic network hardware required for successful communication.
5. select wired or wireless transmission media for given situations.
6. recommend telecommunication technology(ies) use for a given situation.

Content:

1. Definition of networks.
2. Advantages of networks - faster communication, data security, sharing of resources, control of data and resources.
   Disadvantages of networks - identity theft, risk of threats (e.g. hackers, viruses), cost.
3. Networks Classifications:
   a. Local area networks, metropolitan area networks, wide area networks.
   b. The role of networks (Internet, intranet, and extranet) in area of specialization.
4. Network Hardware:
   a. Network interface card, hub, server, router, switch, firewall, wireless access point (WAP), modem.
5. Transmission media- appropriate use in a given situation (advantages disadvantages)
   b. Wired - twisted pair, coaxial, fibre optic.
   c. Wireless - broadcast radio, cellular radio, microwave, satellite, Bluetooth, Wi-Fi.
6. Technologies uses - facsimile, voice mail, voice messaging, telemarketing, teleconferencing, video conferencing, telecommuting, electronic funds transfer, ecommerce, electronic mail, cloud computing.

UNIT VI - Computer Security (4 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. define computer risk and risk management.
2. describe different types of computer risks.
3. apply risk management strategies to counter computer risks.

Content:

1. Definition- risk, computer risk, risk management.
2. General Risk Categories - human error; technical error; virus; natural disasters; unauthorized access and use; theft and vandalism.
3. Risk Management definition of; types of risk management [access codes and passwords; audit trails; log systems; anti-virus software; encryption; physical security measures; backup and recovery procedures, firewall, UPS, surge protectors].

Fundamentals of Information Technology (Lab Modules) ITEC1104

COURSE OUTCOMES:

Upon successful completion of this unit, learners will be able to:

1. explain how to prepare business letters, documents and term papers using a formal document preparation style.
2. explain how to use the spreadsheet software to perform various mathematical calculation and conduct analysis on data.
3. show appreciation for presentation software.
4. explain how to use database management software.

UNIT- I Word Processing (13 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. use word processing interface.

2. insert objects into a document.
3. format texts in a document.
4. apply page formatting techniques.
5. use mail merge to create professional documents.
6. use the APA or other writing styles to prepare documents.
7. manipulate data in tables.
8. use word processing templates.
9. print documents created.

Content:

1. Interacting with the ribbon (including hiding and displaying the ribbon).
2. Inserting Objects: clipart, pictures.
3. Text Formatting:
    a. Alignment: Left, Centre, Right, Justify.
    b. Formatting: Bold, Italics, Underline, Subscript, Superscript, Font sizes and styles.
    c. Copy and paste text, moving text.
    d. Find and replace.
    e. Spacing between paragraphs.
    f. Spell checks.
    g. Indentation.
    h. Use various bullets and numbering techniques (Insertion and customization).
4. Page Formatting:
    a. Page setup Set margins, Paper size, page orientation, Hard and soft page breaks, arrange data in columns (Multiple columns, Column width, converting a single column to multiple columns, converting multiple columns to single columns, Arranging columns for even and odd pages).
5. Creating a professional letter:
    a. Letter formats
    b. Mail merging
6. Preparing a term paper (using APA, MLA, or any such standards):
    a. The cover and title page
    b. Formatting Paragraph: first line indent, paragraph indent, line spacing.
    c. Generating Tables of Content
    d. Headers and footers (including page numbers)
    e. Quotations short and long
    f. Footnotes
    g. Creating reference entries

h. Citations

7. Tables:
    a. Creating tables, Formatting tables: Merging cells, Splitting cells, Shading cells, Cell borders.
    b. Formulas: Sum, Product, Max, Average, Number formats, Text direction.
8. Templates - business card, brochures.
9. Printing:
    a. Choosing a printer, printing single and multiple, Selection print quality, printing multiple copies of the same document.

UNIT II - Presentation Graphics (6 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. create a presentation.
2. run a presentation.
3. modify a presentation.
4. print a presentation.
5. conduct a professional presentation.

Content:

1. Creating a presentation/slideshow.
2. Run a presentation.
3. Viewing and editing presentations.
4. Working with slides:
    a. Inserting new slides
    b. Inserting duplicate slides
    c. Deleting slides
    d. Rearranging slides
    e. Changing the design and the background
5. Working with hyperlinks:
    a. Adding a hyperlink
6. Working with Graphics/Video/Sound (audio clips):

7. Working with animation: Customized, Timing.
8. Printing Presentation:
    a. Single Slides, Handouts, Notes Page

UNIT III - Spreadsheets (13 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. use spreadsheet interface.
2. apply page formatting techniques.
3. use formulas and functions to analyse data.
4. sort data in ascending and descending order.
5. format data.
6. use a formula to manipulate data located in another worksheet.
7. create and format graphs.
8. printing in spreadsheet.

Content:

1. Use spreadsheet interface - interacting with the ribbon (including hiding and displaying the ribbon).

2. Page formatting:
    a. Default margins, Changing the margins (Left, Right, top, bottom).
    b. Default paper size, Changing Paper size (Letter size, Legal size).
    c. Page Orientation.
    d. Add header/footer, custom header/footer

3. Formulas and functions:
    a. Common Math operations:
        i. Add numbers using simple formula or sum function.
        ii. Calculate the average of numbers in a range.
        iii. Determine the smallest number in a range.
        iv. Determine the largest number in a range.
        v. Count cells that contain labels and values only.
        vi. Use simple functions to add, subtract, multiply and divide values in a range.
    b. Create conditional formulas:

i. Perform an action/a calculation based on the result of a condition if, sumif, countif, vlookup.

c. Date operations:
   i. Insert dates only.
   ii. Insert dates with time.
   iii. Calculate the difference between two dates.
   iv. Calculate the difference between two times.

4. Sort data ascending or descending order:
   a. Sort using a single column.
   b. Sort using multiple columns.

5. Format data:
   a. Formatting cells:
      i. Number formats
      ii. Conditional formatting
      iii. Locking

6. Use a formula to manipulate data located in another worksheet:
   a. Copying formulas and functions:
      i. Absolute cell referencing, Relative cell referencing, Using autofill.

7. Create and format graphs:
   a. Selecting appropriate chart.
   b. Inserting chart titles, axes, gridlines, legends, labels, the data source.
   c. Saving graph as a separate sheet and as part of the current sheet Formatting. graphs: Adjust colours, font, and borders, Resizing the graph.
   d. Graphs with trend lines.
   e. Simple Pivot tables.

8. Printing spreadsheet:
   a. Set print area.
   b. Scaling a page to on specific sheet.
   c. Adjust to feature.
   d. Fit to feature.

UNIT IV - Database Management (13 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. define the terms: field, record, relational database, primary key and foreign key.
2. create a database.
3. create a table.
4. manipulate a table.
5. create a relationship between two tables.
6. create queries, forms, and reports.
7. run queries, forms, and reports.
8. import data from a spreadsheet.

Content:

1. Define the terms: field, record, relational database, primary key and foreign key.
2. Create and Maintain a SQL Database:
    a. Learn the guidelines for designing database and setting field properties.
    b. Create a new database.
3. Create a table:
    a. Create and save a table.
    b. Define fields and specify a table's primary key.
    c. Add records to a table.
4. Manipulate a table:
    a. Modify the structure of a table - Delete, move, and add fields, Change field properties.
    b. Copy records and import tables from another database.
    c. Insert, delete, and change records.
5. Create a relationship between two tables.
6. Querying a Database:
    a. Learn how to use the Query window in Design mode.
    b. Create and run select queries.
    c. Sort data in a query.
    d. Specify an exact match condition in a query.
    e. Use the and / OR logical operators.
    f. Use wildcard.

7. Creating Forms and Reports:
    a. Forms:
        i. Create forms.
        ii. Display data using a form.
    b. Report
        i. Create report.
        ii. Insert a picture in a report.
        iii. Preview a report.
        iv. Use tables and queries as data source for report.
8. Importing data from a spreadsheet.

METHODS OF DELIVERY:

1. Lectures
2. Laboratory activities
3. Presentation (individual/group)
4. Projects (Group and Individual)
5. Research
6. Demonstrations
7. Problem Solving

METHODS OF ASSESSMENT AND EVALUATION:

1. Common Coursework (Group Research project) - (should include unit three (3):	10%
2. Word Processing Assessment (APA formatting, mail merge etc).	10%
3. Presentation (using presentation software) (in appropriate professional attire.	10%
4. Practical tests/assessments:	
a. Spreadsheet	10%
b. Database	10%
5. Mid-Semester (Theory) test (should be on Units 1-3)	10%
6. Final Examination	40%

(20 MCQs 1 mark each and 4 ETQs 30 marks each to choose 2) NB changes

History of computers, Emerging Technologies, and Practical Lab Units: In class assessments (N.B. Not to be tested on final examination).

RESOURCE MATERIAL:

Prescribed:

Evans, A. R, Martin, K. & Poatsy, M.A., Technology in Action Complete. 9/E. Prentice Hall.

Misty E. Vermaat, Susan L. Sebok, Steven M. Freund, Jennifer T. Campbell, Mark Frydenberg. *Discovering Computers ©2018: Digital Technology, Data, and Devices*.

Shelly G., Cashman T., &Vermaat M. Microsoft Office 2010: introductory. KY: Course Technology Publishing.

Shelly G., Cashman T., &Vermaat M. Microsoft Office 2007: introductory. KY: Course Technology Publishing.

Recommended:

LaBerta, C. Computers Are Your Future, Introductory, 12/E. Prentice Hall.

Web Resource:

Teach-ict.com.

Http://owl.english.purdue.edu/owl/

THE COUNCIL OF COMMUNITY COLLEGES OF JAMAICA

COURSE NAME:	Introduction to Graphics (using Photoshop and Illustrator)
COURSE CODE:	IGRA1101
CREDITS:	3 credits
CONTACT HOURS:	105 hours (15 hours lecture, 90 hours lab)
PRE-REQUISITES:	None
CO-REQUISITE(S):	None
SEMESTER:	2

COURSE DESCRIPTION:

This course introduces participants to computer graphics. The college has the choice of using Photoshop, Coreldraw or any Open-Source software.

COURSE OBJECTIVES:

Upon successful completion of this course, learners will be able to:

1. use a graphics tool to manipulate a graphic file.
2. define colour theory.
3. use colour management techniques and colour correct images to ensure optimal print output.
4. work in teams
5. conduct independent online and library-based research

UNIT I – The History of Computer Graphics (2 hours)

Learner Outcomes:

Upon successful completion of this course, learners will be able to:

1. Discuss the history of computer graphics.

Content:

1. Prehistoric Computer Graphics1960's to the present.

UNIT II – Introduction to Computer Graphics (2 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. discuss various concepts related to computer graphics.
2. differentiate between raster graphics and vector graphics.

Content:

1. Define computer graphics.
2. The purpose of computer graphics.
3. Types of graphics.
    a. Raster graphics
    b. Vector graphics

UNIT III – Getting Started with Photoshop (3 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. start Photoshop.
2. explore the various features of the software.
3. customize the workspace/Software.
4. create and save a file.
5. close Photoshop.

Content:

1. Starting the software.

2. Exploring various features.
    a. Navigate the software environment.

b. Menu bars, Status bars, Toolbars, application bar, options bar, document window.
c. Keyboard shortcuts (Differences on PC and Mac).

d. Different ways to zoom/pan (Zoom tool, hand tool).
e. Hidden tools on toolbar.

3. Setting Preferences/customizing.
   a. Changing the location of various the panels.
   b. Changing Setting in Preferences Sub Menu.

4. Creating and saving a file.
   a. Using File formats (Export to JPG, GIF, PNG, PXR, TIFF, RAW).
   b. Save file as PSD, PDF.

5. Exit Photoshop.

UNIT IV – Working With Basic Tools (9 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. use Photoshop basic tools and controls.

Content:

1. Use various tools and controls to manipulate graphics.
   a. Move
   b. Crop
   c. Resolution
   d. Palettes
   e. Thumbnails
   f. Selection
   g. (Geometric selections, Freehand selections, Edge-based selections, Colour-based selections)
   h. Masks
   i. Creating Text
   j. Simple editing, Resizing, Positioning
   k. Painting Tools

UNIT V – Layers (9 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. create and manipulate layers in a graphic.

Content:

1. Use and manipulate layers.
   a. Background layer.
   b. Isolating part of image.
   c. Hide, view, reposition, delete, rename, merge.
   d. Lock layers.
   e. Convert background layer to regular layer.
   f. Convert regular layer to background layer.
   g. Layer styles.
   h. Applying layer styles to multiple layers.
   i. Fill and Adjustment Layers.
   j. Exploring Layer Comps.
   k. What are Masks?
   l. Using Layer Masks.
   m. Merging and Flattening Layers.

UNIT VI – Colours & Gradients (9 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. discuss colour theory.
2. select colours.
3. blend colours.
4. create colour gradients.

Content:

1. Colour theory.
2. Choosing a colour.
   a. Using palette

3. Use swatch.
   Blending colours.
   a. Creating patterns
   b. Creating colour gradients
4. Colour correction.
   Using Gradient.
   a. Gradient tool
   b. Gradient styles
   c. Editing colours
   d. Saving gradients

UNIT VII – Filters (10 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. define ‘filter’.
2. explain the purpose of filters.
3. explain the importance filters.
4. apply filters.

Content:

1. Definition of filters.
2. Purpose of filters.
3. Importance of filters.
4. Using Filters.

UNIT VIII – Basic Photoshop Manipulation (9 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. use appropriate methods to get an image into the software.
   a. using the import feature.
   b. drag and drop.
   c. using Open sub-menu.

2. retouch Photographs.

Content:

1. Import an external photo.

2. Modify a photo using appropriate tools and features.
   a. Basic Retouching
      i. Blur tool
      ii. Sharpen Tool
      iii. Smudge Tool
      iv. Dodge Tool
      v. Burn Tool
      vi. Sponge Tool
      vii. Image menu/features
      viii. Colour mode
      ix. Image resolution and size
      x. Straighten and crop image
      xi. Rotate cropped image
      xii. Automatic adjustments
      xiii. Auto colour—removes colour cast
      xiv. Manually adjusting colour cast
      xv. Manually adjusting tonal range
      xvi. Replacing colour
      xvii. Clone tool
      xviii. Spot healing brush
      xix. Healing brush
   b. Advanced Retouching
      i. Quick mask mode
      ii. Using brush tool
      iii. Applying a content-aware patch
      iv. Channels panel
   c. Modifying Digital Photographs
      i. Shadows and highlights adjustment
      ii. Correcting Red Eye
      iii. Sharpening Edges
      iv. Correct Image Distortion

UNIT VIII - Typography (9 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. define ‘typography.

2. explain the anatomy of letter forms.
3. explain type families.
4. use typography to create text and images.

Content:

1. Introduction to Typography.
2. Parts of the line of type.
3. Fonts.
4. Styling and formatting.
5. Using text as image.
6. Using the Type tool.
    a. Point v Paragraph Type.
    b. character panel.
    c. paragraph panel.
    d. Type on a Path.
    e. Warping Type.
    f. Creating work path from type.
    g. Convert type to shapes.
    h. Horizontal/Vertical Type Mask Tool.
    i. Create a selection in the shape of type.

UNIT IX – Automating Tasks (1 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. automate task in Photoshop.

Content:

1. Automate task in Photoshop.
    a. Recording actions.
    b. Actions panel.
    c. Record, play, edit, delete individual actions.

UNIT X – Vectors in Photoshop (8 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. use Photoshop to create vector-based images.

Content:

1. Create vector-based images (Vector Drawing Techniques).
   a. About paths and the Pen tool.
   b. Drawing with the Pen tool.
   c. Working with defined custom shapes.
   d. Importing a Smart Object.
   e. Adding colour and depth to a shape using layer styles.

UNIT XI – Getting Started with Illustrator (1 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. start Illustrator.
2. use the various features of the software.
3. create and save a file.
4. close Illustrator.

Content:

1. Steps to start the software.
2. Starting the software.
   a. Features of Illustrator (Using the workspace).
   b. Exploring the interface.
   c. Choosing a workspace.
   d. Opening a file.
   e. Using artboards.
   f. Changing your view.
   g. Zooming and scrolling.
   h. Using tools and panels.
   i. Exploring the Control panel.
   j. Working with panels and the dock.
   k. Configuring preferences - units, increments, grids/guides, interface.
3. File Types - ai, eps, pdf.
4. Steps to close the program.

UNIT XII – Working with Basic Tools (8 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. manipulate Illustrator basic tools and controls.

Content:

1. Use various tools and controls to manipulate graphics.
   a. Using the shape tools.
   b. Repositioning and resizing shapes.
   c. The Transform panel.
   d. Constraining a shape.
   e. Entering exact dimensions.
   f. Selecting artwork.
   g. Using the shape and transform tools.
   h. Cutting and pasting objects.
   i. Repeating transformations.

UNIT XIII – Working with Colours, Gradients and Drawing Tools (10 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. manipulate colours in Illustrator.
2. using gradients in Illustrator.
3. use the various drawing tools in Illustrator.

Content:

1. Use various tools and controls to manipulate graphics.
   a. Colour theory- RGB/CMYK.
   b. Colours - creating, editing, changing, sharing Spot colours - Pantone™.
   c. Creating Patterns Creating Gradients.
   d. Adding effects.
   e. Saving swatches.
   f. Selecting the same colour.
   g. Creating a colour group.

h. Using the Colour panel.

2. Adding tonal values with gradients.
   a. Customizing an existing gradient.
   b. Saving a gradient.
   c. Using the Gradient panel.
   d. Updating a gradient.
   e. Patterns – Creating, Applying, editing a pattern, Locating existing patterns.
   f. Using the Colour Guide.

3. Using the drawing tools.
   a. Use the Pen tool (Drawing, Modify shapes - cut, join, align, Alignment/smart guides, Drawing using guides).
   b. Straight, curved, and hinged lines.
   c. Tracing images.
   d. Creating a tracing template.
   e. Working with Image Trace.
   f. Using the Line, Pencil, Knife and Eraser tools.
   g. Editing existing paths.
   h. Adding and removing points.
   i. Cutting and joining paths.
   j. The Shape Builder.
   k. Paintbrush and Blob brush tools.
   l. Curvature tool - simple, smooth, more accurate shapes.

UNIT XIV – Layers (4 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. create and manipulate layers in a graphic.

Content:

1. Layers in Illustrator.
   a. Using layers to organize an illustration.
   b. Selecting using the Layers panel.
   c. Creating new layers.
   d. Showing and hiding layers.
   e. Locking and unlocking layers.
   f. Rearranging layers.

g. Moving items between layers.
h. Remembering layers when pasting.
i. Creating a template layer.

UNIT XV - Typography (4 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. use the typography feature to create text.

Content:

1. Typography in Illustrator.
   a. Formatting text
   b. Paragraph formatting
   c. Using paragraph and character styles
   d. Editing styles
   e. Putting text on a path
   f. Warping text
   g. Putting text in a shape
   h. Creating outlines
   i. Checking spelling
   j. Using Find and Replace

UNIT XV – Preparing to Publish and Print (4 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. preparing files for printing.
2. prepare files for the web.

Content:

1. Preparing files for printing.
   a. Performing a “zoom test”.
   b. Identifying out-of-gamut colours.
   c. Adjusting an image.

d. Converting an image to CMYK.
e. Proofing an image on screen.
f. Saving the image as a CMYK EPS file.
g. Printing a CMYK image from Photoshop.

2. Optimizing Images for the Web.
   a. Using Save For Web and Devices.
   b. Creating Image Slices.

Attendance and Participation:

Regular class attendance is mandatory. The college regards both tardiness and early departure from class as forms of absenteeism.

Team Work:

A number of assignments and classroom activities will require that learners work together in teams. Learners will be allowed to 'self-select', failing this, the lecturer will assign membership to teams at his or her discretion.

For each team assignment/activity, learners will be provided with the opportunity to evaluate the contribution of team members. These reviews are confidential and will be incorporated into the final grade for each assignment. Where learners fail to respond, it will be assumed that all members are rated equally.

Learners Preparation:

Learners are expected to engage in out of class activities which include reading and doing practice exercises. They should be prepared to raise questions and participate in class discussions on related topics. Success is dependent upon the students' continued commitment to maintaining a daily study schedule.

Additional Information:

Lecturers/facilitators will provide students with additional course-specific information including reading lists, an assignment schedule and lecturer's contact information as necessary and appropriate.

Instructional/Learning Approaches:
Lectures, labs.

METHODS OF ASSESSMENT:

Coursework Portfolio 100%

RESOURCE MATERIAL:

Prescribed:

(based on software and version being used)

Botello, Chris (2009). Adobe Photoshop CS4 - Illustrated 1st Edition. Course Technology PTR USA.

Bouton, G. (2008) CorelDRAW: The Official Guide. McGraw-Hill Osborne Media.

Peck, A. (2009). Beginning GIMP: From Novice to Professional, Second Edition. Apress USA.

Recommended:

Adobe Creative Team. (2009) Adobe Photoshop CS4 Classroom in a Book. Adobe Press.

Online:

Psdtuts.com

Tutorial9.com

THE COUNCIL OF COMMUNITY COLLEGES OF JAMAICA

COURSE NAME:	Introduction to Computer and Network Security
COURSE CODE:	CSYS1102
CREDITS:	3
CONTACT HOURS:	45 (45 hours theory)
PRE-REQUISITE(S):	Fundamentals of Information Technology (ITECH1104) Networking and Communication Technology (CSYS1208)
CO-REQUISITE(S):	None
SEMESTER	

COURSE DESCRIPTION:

This course provides learners with the knowledge and skills to begin supporting network security within an organization. Data security concepts inclusive of key information assurance concepts and practices such as encryption, authentication, risk analysis, security policy design, digital forensic, cloud computing and implementation. Learners who complete this course will be able to identify security threats and vulnerabilities and help respond to and recover from security incidents.

COURSE OUTCOMES:

Upon successful completion of this course, learners will be able to:

1. explain how to secure information.
2. identify the worst threats to your network and assess your risk.
3. use basic networking knowledge to improve security.
4. identify security policies that will work in your environment.
5. create measures to prevent attack on an organization network.
6. apply basic forensic techniques to enhance computer security.

UNIT I – Computer Security Concepts (4 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. define ‘computer security’.
2. identify top threats to a computer network.

3. assess the likelihood of an attack.
4. define key terms like cracker, sneaker, firewall, and authentication.
5. compare and contrast perimeter and layered approaches to network security.

Content:

1. Define computer security.
   a. The CIA of Computer Security.
   b. The Basics of Information Security.
2. Identifying Types of Threats.
   a. Malware
   b. Compromising System Security
   c. Denial of Service Attacks
   d. Web Attacks
   e. Session Hijacking
   f. DNS Poisoning
3. Assessing the Likelihood of an Attack on Your Network.
   a. Hardware, Software, Data & People Vulnerabilities.
4. Basic Security Terminology.
5. Network Security Paradigms.

UNIT II – Computer Systems Threat (7 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. identify and describe computer systems security threats.
2. describe ways malicious software is delivered.
3. explain security applications implementation.
4. describe methods of securing computer hardware and peripherals.

Content:

1. Computer Systems Security Threats.
   a. Malicious Software
   b. Viruses
   c. Worms
   d. Trojan Horses
   e. Spyware

f. Rootkits
g. Spam
h. Ransomware

2. Ways to Deliver Malicious Software.
   a. Via Software, Messaging, and Media.
   b. Active Interception.
   c. Privilege Escalation.
   d. Backdoors.
   e. Logic Bombs.
   f. Botnets and Zombies.

3. Implementing Security Applications.
   a. Personal Software Firewalls.
   b. Host-Based Intrusion Detection Systems.
   c. Pop-Up Blockers.
   d. Data Loss Prevention Systems.

4. Securing Computer Hardware and Peripherals.
   a. Securing the BIOS.
   b. Securing Storage Devices.
   c. Removable Storage.
   d. Network Attached Storage.
   e. Whole Disk Encryption.

5. Securing Cell Phones and Smartphones.

6. Securing wired networks and wireless networks.

UNIT III – Cyber Stalking, Fraud and Abuse (4 hours)

Learner Outcomes:

Upon successful completion of this unit, leaners will be able to:

1. explain the various types of internet investment scams and auction frauds.
2. explain specific steps one can take to avoid fraud on the internet.
3. explain of what identity theft is and how it is done.
4. identify ways to protect individuals against cybercrimes.

Content:

1. Internet Fraud.

a. Investment Offers.
b. Auction Frauds.

2. Identity Theft.
   a. Phishing.
   b. Cross site Scripting.
3. Cyber Stalking.
   a. Laws about Internet Fraud.
4. Protecting Yourself against Cyber Crime.
   a. Protecting against Investment Fraud.
   b. Protecting against Identity Theft.
   c. Secure Browser Settings.

UNIT IV – Industrial Espionage in Cyberspace (3 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. define what is meant by industrial espionage.
2. identify the low-technology methods used.
3. identify how spyware is used.
4. explain how to protect a system.

Content:

1. What Is Industrial Espionage?

2. Information as an Asset.

3. Real-World Examples of Industrial Espionage.
   a. Example 1: VIA Technology.
   b. Example 2: General Motors.
   c. Example 3: Interactive Television Technologies, Inc.
   d. Example 4: Bloomberg, Inc.
   e. Example 5: Avant Software.
   f. Identify two (2) real-world examples of Industrial Espionage within the last five (5) years.

4. Industrial Espionage and You.

5. How Does Espionage Occur?
   a. Low-Tech Industrial Espionage.
   b. Spyware Used in Industrial Espionage.

c. Steganography Used in Industrial Espionage.

6. Phone Taps and Bugs.
   a. Securing smart devices.

7. Protecting against Industrial Espionage.

8. Industrial Espionage Act.

9. Spear Phishing.

UNIT V – Application Security (3 hours)

Learner Outcomes:

Upon successful completion of this unit, leaners will be able to:

1. describe methods to secure the browser.
2. explain programming vulnerabilities and attacks.
3. explain how programming testing methods assist in secure programming.

Content:

1. Securing the Browser.
   a. General Browser Security Procedures.
   b. Implement Policies.
   c. Train Your Users.
   d. Use a Proxy and Content Filter.
   e. Secure Against Malicious Code.
2. Securing Other Applications.
3. Secure Programming.
   a. Systems Development Life Cycle.
   b. Programming Testing Methods.
   c. Programming Vulnerabilities and Attacks.
      i. Backdoors
      ii. Buffer Overflows
      iii. Directory Traversal
      iv. Zero Day Attack

UNIT VI – Encryption & Computer Security Software (6 hours)

Learner Outcomes:

Upon successful completion of this unit, leaners will be able to:

1. explain the basics of encryption.
2. discuss modern cryptography methods.
3. select appropriate cryptography for an organization.
4. identify the function and protocols of VPNs.
5. evaluate the effectiveness of a virus scanner based on how it works.
6. choose the best type of firewall for a given organization.
7. define anti-spyware.
8. employ intrusion-detection systems to detect problems on a computer system.

Content:

1. Encryption.
   a. Cryptography Basics.
   b. Modern Cryptography Methods.
   c. Single-Key (Symmetric) Encryption.
   d. Public Key (Asymmetric) Encryption.
   e. Legitimate Versus Fraudulent Encryption Methods.
   f. Digital Signatures.
   g. Hashing.
   h. Authentication.
   i. Virtual Private Networks.

2. Computer Security Software.
   a. Virus Scanners.
   b. How Does a Virus Scanner Work?
   c. Virus-Scanning Techniques.
   d. Commercial Antivirus Software.

3. Firewalls.
   a. Benefits and Limitation of Firewalls.
   b. Firewall Types and Components.
   c. How Firewalls Examine Packets.
   d. Firewall Configurations.
   e. Commercial and Free Firewall Products.
   f. Firewall Logs.

4. Antispyware.
    a. Intrusion-Detection Software.
    b. IDS Categorization.
    c. IDS Approaches.
    d. Snort.
    e. Honey Pots.
    f. Other Pre-emptive Techniques.

UNIT VII – Security Policies (4 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. recognize the importance of security policies.
2. explain the various policies and the rationale for them.
3. explain what elements go into good policies.
4. create policies for network administration.
5. evaluate and improve existing policies.

Content:

1. What Is a Policy?

2. Defining User Policies.
    a. Passwords.
    b. Internet Use.
    c. Email Usage.
    d. Installing/Uninstalling Software.
    e. Instant Messaging.
    f. Desktop Configuration.

3. Defining System Administration Policies.
    a. New Employees.
    b. Departing Employees.
    c. Change Requests.
    d. Security Breaches.
    e. Virus Infection.
    f. Denial of Service Attacks.
    g. Intrusion by a Hacker.

4. Defining Access Control.
    a. Developmental Policies.
    b. Standards, Guidelines, and Procedures.

UNIT VIII – Network Scanning and Vulnerability Scanning (3 hours)

Learner Outcomes:

Upon successful completion of this unit, leaners will be able to:

1. explain how to secure a system.
2. probe a system for vulnerabilities.
3. use vulnerability scanning tools.

Content:

1. Basics of Assessing a System.
   a. Patch
   b. Ports
   c. Protect
   d. Policies
   e. Probe
   f. Physical

2. Securing Computer Systems.
   a. Securing an Individual Workstation.
   b. Securing a Server.
   c. Securing a Network.

3. Scanning Your Network.
   a. MBSA
   b. NESSUS

UNIT IX – Cyber Terrorism & Information Warfare (4 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. explain cyber terrorism.
2. explain information warfare.
3. explain plausible cyber terrorism scenarios.
4. appreciate the dangers posed by cyber terrorism.

Content:

1. Actual Cases of Cyber Terrorism.
   a. China Eagle Union
   b. Economic Attacks
   c. Military Operations Attacks
   d. General Attacks
   e. Supervisory Control and Data Acquisitions
   f. Identify two (2) real-world cases of cyber terrorism within the last five (5) years

2. Information Warfare.
   a. Propaganda
   b. Information Control
   c. Disinformation

3. Actual Cases.
   a. Identify real-world cases of information warfare.

4. Future Trends.

5. Positive Trends.

6. Negative Trends.

7. Defense against Cyber Terrorism.

UNIT X – Introduction to Forensic (4 hours)

Learner Outcomes:

Upon successful completion of this unit, learner will be able to:

1. explain basic forensics principles.
2. make a forensic copy of a drive.
3. use basic forensics tools.

Content:

1. General Guidelines.
   a. Don't Touch the Suspect Drive.
   b. Document Trail.
   c. Secure the Evidence.

d. FBI Forensics Guidelines.

2. Finding Evidence on the PC.
    a. Finding Evidence in the Browser.

3. Finding Evidence in System Logs.
    a. Windows Logs
    b. Linux Logs

4. Getting Back Deleted Files.
    a. Operating System Utilities
    b. Net Sessions
    c. Open files
    d. Fc
    e. Netstat

5. The Windows Registry.

METHODS OF DELIVERY:

1. Lectures
2. Demonstrations
3. Discussions
4. Tutorial
5. Research
6. Lab work
7. Case Study

METHODS OF ASSESSMENT AND EVALUATION:

1. Common Coursework	20%
2. Internal Tests	20%
3. Final Examination	60%

(20 MCQ's 1 mark each and 4 ETQs 30 marks each to choose 2)

RESOURCE MATERIAL:

Prescribed:

Easttom, C. (2012). *Computer Security Fundamentals* (2nd ed.). USA: Pearson.

Recommended:

Prowse, D. L. (2012). *CompTIA Security+ SY0-301 Authorized Cert Guide, 2/E.* Pearson IT Certification.

Other online resources:

https://www.**ebscohost**.com www.springerlink.com/books

THE COUNCIL OF COMMUNITY COLLEGES OF JAMAICA

COURSE NAME:	Introduction to Management
COURSE CODE:	MGMT1101
CREDITS:	3
CONTACT HOURS:	45 (45 hours theory)
PRE-REQUISITE(S):	None
CO-REQUISITE(S):	None
SEMESTER:	

COURSE DESCRIPTION:

This course is designed to provide learners with a comprehensive introduction to the range of decisions encountered by managers in business organizations. Emphasis will be placed on the application of the theories of management to "real-life" situations with a view of highlighting the managerial functions. Through the course, learners are expected to improve their skills to manage their study and personal lives. In addition, they will be equipped with management competence to enhance and understanding of managerial ethics for their future career.

COURSE OUTCOMES:

Upon successful completion of this course, learners will be able to:

1. explain the functions and principles of management necessary to ensure organizational success.
2. develop an overview and understanding of the basic principles of management.
3. explain the foundation of Classical Management theories and their impact on modern management.
4. explain the role and function of organizational structure in goal achievement.
5. explain the relationship between management structure and leadership.
6. explain concrete organizational scenarios, management dilemmas and decisions-making.
7. explain critical thinking when presented with managerial problems.
8. explain the importance of corporate social responsibility in a globalized environment.

UNIT I- Introduction to Management (6 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. explain how managers differ from non-managerial employees.
2. describe how managers are classified in the organization.
3. define the term management.
4. explain why efficiency and effectiveness are important to management.
5. analyze the main functions of management.
6. assess Mintzberg's managerial roles.
7. evaluate the effectiveness of the contribution of management functions and roles to the organization.
8. examine the importance of each managerial skill.
9. discuss the rewards and challenges of being a manager.

Content:

1. Managers and non-managerial employees.
2. Levels of managers in organisations: top, middle, first line managers and non-managerial employees.
3. Management defined.
4. Importance of efficiency and effectiveness.
5. The functions of management: planning, organizing, leading, and controlling.
6. Mintzberg's managerial roles: interpersonal, informational, and decisional.
7. The contribution of management functions and roles to the organization.
8. Managerial skills: technical, human, and conceptual.
9. Rewards and challenges of a manager.

UNIT II- Foundations of Modern Management (9 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. examine the historical background of management.
2. assess the contributions of theories to the practice of management in today's organization.
3. discuss the development and uses of the behavioural approach to management practices today.
4. evaluate the various theories in the contemporary approach to modern management.

Content:

1. Historical background of management: Egyptian pyramids and the Great Wall of China, Adam Smith and the Industrial Revolution.

2. The classical approach:
   a. Theory of Scientific Management: Frederick Taylor and Frank and Lillian Gilbreth.
      i. How today's managers use scientific management.
   b. General Administrative Theory: Henri Fayol and Max Weber.
      i. How today's managers use general administrative theory.

3. Behavioural Theory of Management: Owen, Munsterberg, and Follett (Hawthorne Studies) How today's managers use the behavioral approach.

4. Contemporary approaches to modern management:
   a. Systems Approach: open and close.
   b. Contingency Approach and variables.

UNIT III- Organizational Structure and Design (8 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. define the term 'organization'.
2. explain the characteristics of an organization.
3. define the following terms: organizing, organizational structure, chart, and design.
4. discuss the traditional and contemporary views of the six key elements in organizational design.
5. illustrate and describe the five common forms of departmentalization.
6. compare and contrast mechanistic and organic structures.
7. discuss the contingency variables that favour either the mechanistic model or the organic model of organizational design.
8. describe the traditional and contemporary organizational designs.
9. explain the strengths and weaknesses of the traditional and contemporary organizational designs.

Content:

1. Organization.

2. Characteristics of an organization: distinct purpose, deliberate structure, and people.

3. Key terms: organizing, organizational structure, organizational chart, and organizational design.

4. Six key elements in organizational design: work specialization, departmentalization, chain of command (authority, line and staff authority, responsibility, unity of command), span of control, centralization and decentralization, and formalization.

5. Five common forms of departmentalization: functional, geographic, product, process, and customer.

6. Mechanistic and organic structures.

7. Contingency variables: the organization's strategy, size, technology, and degree of environmental uncertainty.

8. Organizational designs:
   a. Traditional - simple, functional, and divisional.
   b. Contemporary - team, matrix, and boundary less.

9. Strengths and weaknesses of the traditional and contemporary designs.

UNIT IV - Leadership (4 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. explain their understanding of leader and leadership.
2. distinguish between leadership and management.
3. examine the various leadership traits.
4. compare and contrast the various classical leadership styles.
5. differentiate between the contemporary views of leadership and how are they applicable in today's organizations.
6. discuss the three major contingency theories of leadership.
7. analyze cases relevant to leadership and its relevance for organization.

Content:

1. Leader and leadership.
2. Management and leadership.

3. Leadership traits: drive, desire to lead, honesty and integrity, self-confidence, intelligence, job relevant knowledge and extraversion.
4. Classical styles of leadership: autocratic, democratic, and laissez-faire.
5. Contemporary views of leadership: transformational, transactional, charismatic, visionary and team.
6. Contingency theories of leadership: Fiedler model, Situational leadership theory, Path Goal theory.
7. Relevant cases.

UNIT V- Decision Making Environment (9 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. define the term 'decision'.
2. illustrate and explain the eight steps in the decision-making process.
3. discuss two perspectives on how managers make decisions.
4. distinguish between structured problems, programmed and unstructured problems, non-programmed decisions.
5. explain the types of decision-making conditions.
6. describe the classical and administrative models of decision making and their applications.
7. analyse cases relevant to decision making within organizations.

Content:

1. Decision defined.
2. Steps in the decision-making process: identifying a problem, identifying decision criteria, allocating weights to the criteria, developing alternatives, analysing alternatives, selecting an alternative, implementing the alternatives, and evaluating decision effectiveness.
3. Perspectives: rationality decision making, bounded rationality and satisficing.
4. Structured problems and Programmed vs. unstructured problem and non-programmed decisions.
5. Decision making conditions: certainty, risk, and uncertainty.
6. Models of decision making: classical and administrative.
7. Relevant cases.

UNIT VI- Corporate Social Responsibility (9 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. define corporate 'social responsibility'.

2. differentiate between social obligation and social responsiveness.
3. discuss whether organizations should be socially involved.
4. explain the organization's ethical responsibilities to its stakeholders.
5. discuss the importance of each type of social responsibility in the organization.
6. assess the importance of corporate social responsibility in a globalized society.
7. critique the theories of corporate social responsibility.

Content:

1. Corporate social responsibility.

2. Social obligation and social responsiveness.

3. Arguments for and against social responsibility:
   a. Arguments for: public expectation, long run profit, ethical obligation, public image, better environment, stockholder interests etc.
   b. Arguments against: violation of profit maximization, dilution of purpose, costs, too much power, lack of skills and lack of accountability.

4. Stakeholders: owners, investors, employees, suppliers, customers, competitors, government, and society.

5. Types of social responsibility: philanthropic/discretionary, ethical, legal, economic.

6. Importance of corporate social responsibility in a globalized society.

7. Theories of social responsibility: Andrew Carnegie, Milton Friedman, Archie Carroll, Robert Ackerman.

METHODS OF DELIVERY:

1. Lectures
2. Guest lectures
3. Discussions
4. Case Studies
5. Movies
6. Podcast
7. Video Diaries
8. Collaborative/Cooperative Learning
9. Problem-Based Learning
10. Role Plays
11. Field trips

METHODS OF ASSESSMENT AND EVALUATION:

1. Common Coursework 20%
2. Group Presentation 10%
3. Mid-term quiz or Individual Assignment 10%
4. Final Examination 60%

RESOURCE MATERIAL:

Prescribed:

Robbins, S. P., & Coulter, M. (2012). Management (11th Ed.). NJ: Prentice Hall.

Supplemental Readings:

Daft, R. *(*2000*).* Management study guide (6th Ed.). KY: South West College.

George, Jennifer M., & Jones, Gareth R. (2007) Contemporary Management, (5thed.). McGraw-Hill/Irwin.

Robbins, S. P., & DeCenzo, D. A. (2008). Fundamentals of Manage*ment* (6thed.). NJ: Prentice Hall.

Whetten, David A., & Cameron, Kim S. (2007). Developing Management Skills (7th ed.). Pearson Prentice Hall.

Internet Resource:

Harvard Business Review Case Studies, Articles, Books, Pamphlets **...**http://hbr.org/

Articles from internet, e.g. http://www.mindtools.com/

Journals and periodicals:

1. Harvard Business Review
2. Academy of Management Review
3. British Journal of Management
4. Wall Street Journal
5. BusinessWeek
6. Fortune

RESOURCE MATERIAL:

Prescribed:

Evans, A. R, Martin, K. & Poatsy, M.A., Technology in Action Complete. 9/E. Prentice Hall.

Shelly G.B., & Cashman, T.J. Discovering computers *2012.* Complete Shelly Cashman Series. KY: Course Technology Publishing.

Shelly G., Cashman T., &Vermaat M. Microsoft Office 2010: introductory. KY: Course Technology Publishing.

Shelly G., Cashman T., &Vermaat M. Microsoft Office 2007: introductory. KY: Course Technology Publishing.

Recommended:

LaBerta, C. Computers Are Your Future, Introductory, 12/E. Prentice Hall.

Web Resource:

Teach-ict.com.

Http://owl.english.purdue.edu/owl/

THE COUNCIL OF COMMUNITY COLLEGES OF JAMAICA

COURSE NAME:	Introduction to Parallel and Distributed Computing
COURSE CODE:	IPAR2001
CREDITS:	3
CONTACT HOURS:	45 hours (45 hours theory)
PRE-REQUISITE(S):	Fundamentals of Information Technology
CO-REQUISITE(S):	None
SEMESTER:	

COURSE DESCRIPTION:

This course provides an integrated view of the various facets of software development on such systems: hardware architectures, programming languages and models, software development tools, software engineering concepts and design patterns, performance modelling and analysis, experimenting and measuring.

COURSE RATIONALE:

This course will help learners to develop sound knowledge, and good understandings of the foundations of parallel programming. It explores the efficient application of parallel and distributed systems (multi-processors and computer networks) and establish them as important tasks for Information Communication Technologists. The goal of this course is to provide an integrated view of the various facets of software development on such systems: hardware architectures, programming languages and models, software development tools, software engineering concepts and design patterns, performance modelling and analysis, experimenting and measuring.

COURSE OUTCOMES:

Upon successful completion of this course, learners will be able to:

1. explain the nature and structure of the computer's architecture and operating system.
2. explain basic concepts and the application of the parallel and distributed computing.

UNIT I - Introduction to Parallel and Distributed Programming (4 hours)

Learner Outcomes:

Upon successful completion of this unit learners will be able to:

1. differentiate between serial and parallel computing.
2. discuss the concepts and terminologies related to parallel computing.
3. explain the nature and structure of the computer's architecture and operating system.
4. explain the advantages of parallel computing.

Content:

1. Definition of parallel computing.
2. Definition of distributed computing.
3. Terminologies – task, parallel task, communications, pipelining, synchronization, granularity, parallel overhead, scalability, symmetric multi-processor (SMP), load balancing.
4. Flynn's classical taxonomy.

UNIT II - Parallel Computing – Architectures, Paradigms & Issues (6 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. discuss the various architectures, paradigms and issues related to parallel computing.

Content:

1. Shared memory architecture.
2. Distributed memory architecture.
3. Threads.
4. Message passing.
5. Data parallel.

UNIT III - Parallel Programming using Message Passing (3 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. explain how tasks exchange data by sending and receiving messages.

Content:

1. Sending and receiving messages.

UNIT IV - Parallel Programming using Shared Memory (3 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. discuss the advantages of using shared memory.
2. explain how locks and semaphores may be used to control shared memory access.

Content:

1. Locks.
2. Semaphores.

UNIT V - Parallel Algorithms and Applications (8 hours)

Learner Outcomes:

Upon successful completion of this unit, students should be able to:

1. discuss the various algorithms and applications of parallel computing.
2. design parallel programs.
3. develop parallel programs.
4. model and analyze the performance of parallel programs.

Content:

1. Automatic parallelization.
2. Manual parallelization.
3. Parallelizable problems.
4. Non-parallelizable problems – Fibonacci series.
5. Domain decomposition.
6. Functional decomposition.
7. Array processing.
8. Odd-even transposition sort.
9. The n-body problem.
10. Floyd's Algorithm.

11. Game Trees.
12. Divide and Conquer Algorithms.

UNIT VI - Introduction to Distributed Computing (4 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. differentiate between centralized and distributed computing.
2. differentiate between a network operating system and a distributed operating system.
3. discuss the benefits of distributed computing.
4. discuss various concepts related to distributed computing.

Content:

1. Characterization of Distributed Systems.
2. Network OSs vs. distributed Oss.
3. Research and design issues.

UNIT VII - Distributed Programming Issues and Algorithms (5 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. discuss the issues related to distributed computing.

Content:

1. Challenges – Heterogeneity, Latency, Remote Memory vs Local Memory, Synchronization, Partial failure, Need for "openness", security, scalability, transparency.

UNIT VIII - Distributed Computing Tools & Technologies (6 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. discuss the tools and technologies related to distributed computing.

Content:

1. Interposes Communication - Issues in message passing, Client-server communication.
2. Remote Procedure Call - Design issues for RPC, Case study: Sun RPC.
3. Synchronization - Event ordering/synchronization, Centralised vs. distributed schemes.
4. Group Communication - Ordered, reliable, and casual multicast, Group membership, Atomic group multicast, Virtual synchrony, Case Study: ISIS.
5. Service Replication/Reliable Services.
6. Distributed Shared Memory - Shared memory, Consistency models, Design issues, Case studies: Ivy/Munin/Trademarks.
7. Distributed File Services – Model, Case Study: NFS, Case study: AFS, Case study: CODA.
8. Distributed Naming Services - Names, addresses, routes, capabilities, Naming facilities, name distribution, Name resolution, Migration.

UNIT IX - Grid, Autonomic and Peer-to-Peer Computing (3 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. discuss grid, autonomic and peer-to-peer computing.
2. discuss the challenges associated with grid, autonomic and peer-to-peer computing.

Content:

1. Definitions.
2. PC vs Cluster vs Grid.
3. Grid, autonomic – pervasive, knowledge based.
4. Supporting Internet Applications of the Future – Issues, Active networks, Liquid software, Peer-to-peer.

METHODS OF DELIVERY

To facilitate fulfillment of the requirements of this course, the teaching and learning sessions will utilize the following approaches:

1. Demonstrations
2. Guided Practice
3. Group Work
4. Independent Lab work
5. Independent Work
6. Research

7. Lectures
8. Presentations

METHODS OF ASSESSMENT AND EVALUATION:

In this course marks will be assigned as follows:

1. Courseworks: (Written papers and labs) 60%
2. Examination: (Mid-term 10%; Final 30%) 40%

RESOURCE MATERIAL:

Prescribed

Foster, I. (1995). *Designing and building parallel Programs --Concepts and tools for parallel software engineering*. Reading, MA: Addison Wesley.

Hwang, K. (1993). *Advanced computer architecture: Parallelism, scalability, programmability.* New York: McGraw-Hill.

Quinn. M. J. (2003). *Parallel programming in C with MPI and OpenMP*. New York: McGraw-Hill, New York.

Recommended

Coulouris, G., Dollimore, J., Kindberg, T. [2001]. "Distributed Systems: Concepts and Design; 3rd Edition. Addison Wesley (ISBN 0-201-61918-0).

Tanenbaum, A. S. & v Steen, M. [2002]. Distributed Operating Systems.: Principles and Paradigms. Prentice Hall Pub. USA.

THE COUNCIL OF COMMUNITY COLLEGES OF JAMAICA

COURSE NAME:	Introduction to Programming
COURSE CODE:	CPRG1201
CREDITS:	3
CONTACT HOURS:	75 (30 hours theory, 45 hours practical)
PRE-REQUISITE(S):	None
CO-REQUISITE(S):	None
SEMESTER:	

COURSE DESCRIPTION:

This course is designed as the first course in structured computer programming with an emphasis on problem solving techniques and structured algorithm development approach. The knowledge acquired from the study of this course will serve as a basis and a pre-requisite for all subsequent programming courses. The Visual Studio 2010 - C# language will be used to illustrate all concepts taught.

COURSE OUTCOMES:

Upon successful completion of this course, learners will be able to:

1. explain the different terminologies and concepts associated with programming languages and Software.
2. define data types and data storage.
3. appreciate the relevance of algorithms in program development.
4. demonstrate pseudo coding and flowcharting skills.
5. use control structures for efficient program development.
6. appreciate the different data structures.
7. apply different program design strategies.
8. use logical and critical thinking skills.

UNIT I - Programming Terminologies and Concepts (5 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. define ‘Computer programming’.

2. outline at least five (5) needs for computer programming.
3. describe the different category of programming languages.
4. discuss the advantages and disadvantages of the different translator programs.
5. differentiate between the concepts syntax and semantics.
6. evaluate the two major approaches to program design.
7. identify the basic elements of a program.
8. outline the program development life cycle.

Content:

1. Clearly state what is computer programming.
2. Needs for computer programming -automation, reliability, convenience, efficiency.
3. Low –level vs. High-Level Programming (advantages and disadvantages).
4. Compilers, Interpreters and Assemblers (importance, advantages, disadvantages).
5. Syntax, semantics of a programming language.
6. Procedural versus object-oriented designs.
7. The basic elements of a program (input, output, processing).
8. Program Development Life Cycle (Analyse user requirements, Design the program, code the program, Document, and test system, Operate and maintain system).

UNIT II - Introduction to Algorithm and Pseudocode (10 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. define the term ‘algorithm’.
2. develop algorithms using real world scenarios.
3. define the term pseudocode.
4. define an identifier.
5. list at least four (4) major data types used in the construction of psuedocodes.
6. identify the different elements of a pseudocode.
7. convert a problem statement to Pseudocode.

Content:

1. Clearly state what is an algorithm.
2. Use everyday real-world scenarios such as preparing a meal.
3. Clearly state what is a Pseudocode.
4. Identifiers (Variable, constant, literal).
5. Integer, real, string, character.

6. Use problem definition to identify the basic elements of a program (IPO chart/Process tables).
7. Pseudocode - Input Statement, Assignment Statement, Output Statement.

UNIT III - Develop Basic Pseudocode, Flowcharting and C# Skills (20 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. develop simple pseudocode utilizing proper indentation procedures and naming conventions.
2. identify and use different flowchart symbols.
3. convert pseudocode to flowchart and flowchart to pseudocode.
4. use trace tables to test the execution of a pseudocode.
5. Identify the basic structure of a C# program.
6. convert pseudocode and flowchart to C#.

Content:

1. Pseudocode - Indentation procedures, Naming conventions.
2. Utilize appropriate flowcharting symbols to arrive at a solution.
3. Use appropriate flowcharting symbols to convert from a pseudocode and vice versa.
4. Use trace tables to test the accuracy of solution.
5. Identify the system directives, namespace, class, main, body.
6. Implement solution using C#.
    a. C# Data types (int, float, bool, byte, sbyte decimal, char, string, double, enum, long, short, uint, ulong, ushort)
    b. Input statement
    c. Processing statement
    d. Output statement
    e. Compiling and Executing a C# program

UNIT IV- Control Structures (15 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. identify the three categories of control structures.
2. select the appropriate control structure to create a pseudocode solution.
3. use truth tables to critically analyse control structures.
4. convert pseudocode to flowchart while applying control structures.

5. convert pseudocode to C# while applying control structures.

Content:

1. Sequential, selection and repetition control structures.

2. Solve problems using:
   a. Selection – If, If-else, if-else-if, Case (Switch).
   b. Repetition – Infinite, indefinite and definite loops (While loop, Do While, For, Foreach).

3. Truth tables (AND, OR and NOT).

4. Use appropriate flowchart symbols to represent control structures using the pseudocode.

5. C# implementation of control structures.

UNIT V- Array Data Structures (15 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. define an 'array'.
2. manipulate one dimensional array data structures using pseudocode.
3. implement a single dimensional array in C#.
4. implement a two-dimensional rectangular array in C#.

Content:

1. Clearly define an array.
2. Declaring an array, initialization, populating an array, accessing members, displaying members using pseudocode.
3. Declaring a single dimensional array, initialization, populating an array, accessing members, displaying members in C#.
4. Declaring a two-dimensional rectangular array, initialization, populating an array, accessing members, displaying members in C#.

UNIT VI - Program Design Strategies (10 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. differentiate between the Top-Down and Bottom-Up design.

2. explain the concept of a local and global scope.
3. distinguish between a function and a procedure.
4. choose the appropriate design strategy to solve a given problem.
5. apply the principles of modularity to solve different problems using pseudocode.
6. discuss the importance of modularity within the C# environment.
7. demonstrating modularity using C#.

Content:

1. Top-down design versus bottom-up design.
2. Local and global variables.
3. Modularity (Functions, Procedures).
4. Use top-down and the bottom-approach to solve problems.
5. Main-module, parameter passing, function calls, calling-module, called-module, local and global variables.
6. Importance of modularity -reuse of code, easier debugging, rapid application development.
7. Using modularity to solve real world scenario, by applying C# skills.

METHODS OF DELIVERY:

1. Lectures
2. Lab Work
3. Practical Worksheet
4. Problem Solving and discussions
5. Demonstrations
6. Presentation
7. Simulation
8. Research

METHODS OF ASSESSMENT AND EVALUATION:

1. Common Course Work	-	30%	
a. Coursework 1 (individual)	-	15%	- Units 2, 3 and 4
b. Coursework 2 (group)	-	15%	- Units 5 and 6
2. Internal Course Work – Test	-	20%	
a. Internal Coursework (Theory)	-	10%	- Units 1 to 4
b. – Pseudocode, flowchart, trace table			
c. Internal Coursework (Practical)	-	10%	- Unit 4 and 5 – C#
3. Final Exam-		40%	

RESOURCE MATERIALS:

Prescribed:

Bohl, M., & Rynn, M. (2007). Tools for structured programming and object -oriented design: an introduction to programming logics, (7th ed.). NJ: Prentice Hall.

Recommended:

Bell, D., Parr M., *C#* for Learner, Revised Edition. Pearson Education.

Deitel & Deitel. (2010). Visual C# 2010 How to Program 4th Edition. Pearson Education, Inc.

Gaddis, D., Starting Out with Visual C# (2010) Second Edition. Pearson Education.

Mayo, J. (2008) Sams.C.Sharp 3.0.Unleashed.With.the.dot.NET.Framework.3.5

Palmer, W. (2012). Discovering Arguments: An Introduction to Critical Thinking, Writing and Style. (4th Edition) Longman.

Robertson, L. A. (2006). Simple program design: A step by step approach (5th Ed.). KY: Course Technology.

Robinson, D. (2003) Fundamentals of structured design (2nd Ed.). NJ: Prentice Hall.

http://www.tutorialspoint.com/csharp/

Other online resources:

https://www.**ebscohost**.com

www.springerlink.com/books

THE COUNCIL OF COMMUNITY COLLEGES OF JAMAICA

COURSE NAME:	Introduction to Psychology I
COURSE CODE:	PSYC1111
CREDITS:	3
CONTACT HOURS:	45 (45 hours theory)
PRE-REQUISITE(S):	None
CO-REQUISITE(S):	None
SEMESTER:	

COURSE DESCRIPTION:

This course is designed primarily to provide learners with a general understanding and appreciation of human behaviour and its impact on social and business relationship. More specifically, the course will cover approaches to the study of psychological, biological and developmental bases of behaviour, perception, attitude, motivation, conflict and change and stress management.

COURSE OUTCOMES:

Upon successful completion of this course, learners will be able to**:**

1. explain psychology as an area of study.
2. develop an understanding of the theories and the role of the theorists in the study of psychology.
3. explain the biological and developmental bases of behaviour.

UNIT I –The Nature of Psychology (9 hours)

Learner Outcomes:

Upon successful completion of this unit, leaners will be able to:

1. define and use relevant definitions relating to psychology and its areas of study.
2. discuss the eight critical thinking guidelines in psychology.
3. examine the five major approaches to the study of psychology and their proponents.

4. differentiate among the various approaches in (3) above.
5. use the various psychological theories of development to explain behaviour.
6. identify the methods and tools used by psychologists to investigate psychological issues.

Content:

1. The Nature of Psychology:
   a. Psychology- Definition (scientific study).
   b. As a behavioural science: relevance to career fields.

2. The eight critical thinking guidelines in psychology.

3. Approaches and application: Structuralism, Functionalism, Gestalt, Biological, Cognitive, Behavioural, Humanistic, Evolutionary, Psychodynamic/Psychoanalytical.

4. Psychological thinkers and their theories: Freud, Erikson, Piaget, Watson, Skinner, Maslow, Pavlov, Rogers.

5. Research methods: tests, experiment, survey, case study, observation, correlation.

Suggested Activities:

1. Apply critical thinking guidelines to popular, as well as psychological claims.
2. Class discussion on how the contemporary perspectives in psychology would explain crime and violence in Jamaica.

UNIT II – Biological and Developmental Bases of Behavior (8 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. describe the divisions of the nervous system and explain how behaviour is driven by the nervous system.
2. explain the relationship among genes, environment, and behaviour.
3. define developmental psychology.
4. discuss the factors governing development of behaviour.
5. explain and compare the different approaches to psychological development.
6. use the theories of psychological development to explain human behaviour.
7. relate the stages of psychological development to types of behaviour.

Content:

1. Biological Bases of Behaviour.
   a. The nervous system: CNS, PNS etc.
   b. Genetic influences on behaviour.

2. Developmental Psychology: definition.
   a. Environmental influences on behaviour: nature/nurture debate.
   b. Factors that influence development.
   c. Theories of development: Kohlberg (moral reasoning); Freud (psychosexual); Piaget (cognitive); Erikson (psychosocial).

Suggested Activities:

1. Class discussion, wherein students are asked to share any personal experience that supports any stage of Erik Erikson's, Lawrence Kohlberg's or Freud's theories.
2. Discussions on the level of morality typically demonstrated in Jamaica.

UNIT III –Perception (4 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. define and use the important terms relating to perception.
2. assess the relationship between perception and behaviour.

Content:

1. Perception (definition):
   a. Sensation
   b. Selective attention
   c. Illusion
   d. Perceptual organization
2. Factors influencing perception:
   a. Motives
   b. Interests
   c. Person
   d. Target

3. Illusion:
    a. Constancies (size, shape, brightness, colour)
    b. Figure ground
4. Stereotyping.

Suggested Activity:

A class discussion on the movie "The Matrix" and the concept of perception without sensation.

UNIT IV – Attitudes (4 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. formulate working definition of attitude.
2. examine the components of attitude.
3. explain the development of:
    a. cognitive dissonance
    b. prejudice
    c. stereotyping

Content:

1. Attitude (definition).
2. Components and formation of attitude (affective, behavioural, cognitive).
3. Changing Attitudes:
    a. Cognitive Dissonance
    b. Prejudice
    c. Stereotyping

Suggested Activity:

Examine a case in which cognitive dissonance was evident and explain how attitudes were changed in the situation.

UNIT V – Personality (5 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. define the 'concept personality'.

2. differentiate between two theories of personality.
3. assess the importance of positive self-concept to the development of self-esteem.
4. identify the different types of defence mechanisms and explain how these might be used in various situations.

Content:

1. Personality (definition).

2. Theories of Personality:
   a. Psychoanalytic (Freud)
   b. Humanistic (Rogers)
   c. The Big Five Personality (Eysenck)
3. Development of self-concept/ self-esteem.
4. Defence mechanisms (types and uses).

Suggested Activity:

Students should assess their own personality using the tenets of one of the theories of personality.

UNIT VI –Motivation (5 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. define and use correctly the concepts relating to motivation.
2. apply theories of motivation to the explanation of behaviour in given situations.

Content:

1. Motivation:
   a. Definitions and concepts:
      i. Drive
      ii. Needs
      iii. Motives
   b. Theories of motivation:
      i. Abraham Maslow: Maslow Hierarchy of Needs.
      ii. Frederick Herzberg: Two Factor Theory.
      iii. David McClelland: Theory of Needs.

Suggested Activity:

Class discussion on how Maslow's theory may be applied in the Jamaican education system.

UNIT VII – Conflict and Change (6 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. Conflict:
   a. define and use correctly the concepts relating to conflicts.
   b. assess potential causes of conflicts as they operate in given situations.
   c. apply appropriate conflict resolution techniques to given situations.
   d. evaluate the effects (positive and negative) of conflict on relationships.

2. Change:
   a. define and use correctly the concepts relating to change.
   b. identify and describe different agents of change.
   c. apply the approach-avoidance theory in situations in Jamaica.
   d. give reasons for resistance to change.
   e. identify and utilize techniques for reducing resistance to change.

Content:

1. Conflict and Change:
   a. Conflict:
      i. Definition.
      ii. Lewin's Approach-Avoidance Theory/ Types of Conflict (approach-approach, avoidance-approach, avoidance-avoidance, double approach-avoidance).
      iii. Causes of conflict.
      iv. Conflict resolution techniques- collaboration, compromise, competition, avoidance, accommodation.
      v. Effects of conflict- positive and negative.
   b. Change:
      i. Definition.
      ii. Change Agent- role, types (internal and external).
      iii. Reasons for resistance to change.
      iv. Techniques for reducing resistance to change- communication/ education etc.

Suggested Activity:

Resolve a conflict using one conflict resolution technique examined.

UNIT VIII – Stress (4 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. define the concept of stress.
2. identify causes of stress in given situations.
3. identify and explain the symptoms of acute stress.
4. use the theories of psychological development to recommend techniques for managing stress.

Content:

1. Stress.
    a. Definition.
    b. Causes.
    c. Symptoms of acute stress.
    d. Stress Management Techniques:
        i. Relaxation
        ii. Exercise
        iii. Time management

Suggested Activity:

Learners demonstrating through roleplay the symptoms of acute stress and a stress management technique.

METHODS OF DELIVERY

This course will be administered through the delivery of lectures and interactive tutorials covering a wide range of topics designed to facilitate practical opportunities for learning and application of sports psychological techniques.

1. Lectures
2. Case Studies
3. Class Work
4. Class Quizzes
5. Video Presentations
6. Discussions
7. Research
8. Simulation
9. Role Play

METHODS OF ASSESSMENT AND EVALUATION

1. Common Coursework (Mid-semester) 10%
2. College Coursework (Project) 20%
3. Presentation 10%
4. Final Examination (2 hours) 60%

RESOURCESMATERIAL:

Prescribed Text:

Rathus, S. A. (2002). Essentials of psychology. (7th ed.). FL: Harcourt Publishing.

Wade, C. & Tavris, C. (2010). Psychology (10th ed). Upper New Saddle, NJ: Pearson Education.

American Psychological Association (APA) - www.apa.org

www.ebscohost.com

THE COUNCIL OF COMMUNITY COLLEGES OF JAMAICA

COURSE NAME:	Networking and Communication Technology	
COURSE CODE:	CSYS1208	(**September 2019**)
CREDITS:	3	
CONTACT HOURS:	75 (45 hours theory, 30 hours practical)	
PRE-REQUISITE(S):	Fundamentals of Information Technology	
CO-REQUISITE(S):	None	

COURSE DESCRIPTION:

This course is intended to prepare participants with the fundamental knowledge of networking hardware devices, concepts of LAN and WAN network models, routing and switching technology, IP addressing, subnetting, cloud computing, virtualization, wireless, wired technologies and configurations along with a host of other key areas in networking. It aims to increase their knowledge, understanding and to enable the requisite skill sets necessary to prepare them for an entry level career in network support or administration.

It covers the first two objectives/domains (Networking Concepts and Infrastructure) of the international CompTIA Network+ certification examination (N10-006), this amounts to 50% of the current CompTIA Network+ course. This course a pre-requisite for the Advance Computer Networking course (CSYS4803) which covers an additional 49% of the core objectives of the Network+ certification exam administered by the Computing Technology Industry Association (CompTIA).

COURSE OUTCOMES:

Upon successful completion of this course, you should:

1. appreciative of network ports and protocols.
2. familiar with the OSI and TCP/IP model fundamentals.
3. knowledgeable about concepts and characteristics of routing and switching technology.
4. aware of IP addressing components.
5. acquainted with the characteristics of network topologies, types and technologies.
6. comprehend the value of wireless technologies and configurations.

7. understand cloud concepts and their purposes.
8. know about network services functions.
9. understand the value of network cabling solutions.
10. familiar with network devices.
11. understand virtualization and network storage technologies.
12. able to grasp the significance of WAN technologies.

UNIT I - Characteristics of Network Topologies, Types and Technologies (4 Hours)

Learner Outcomes:

Upon successful completion of this unit, you will be able to:

1. Give a definition for a computer network.
2. Describe the properties and functions of the main types of networks.
3. Distinguish between wired and wireless topology.
4. Differentiate between logical and physical topology.
5. Compare and contrast the types of wired topologies including diagrams of each.
6. Compare and contrast the types of wireless topologies including diagrams of each.
7. Use network virtualization software to build, test wired and wireless types of topologies.
8. Summarize the functions of the type of technologies that facilitate the internet of things (IoT).

Content:

1. Computer network definition.
2. Types of networks:
    a. LAN
    b. WLAN
    c. MAN
    d. WAN
    e. CAN
    f. SAN
    g. PAN
3. Wired vs. wireless topology.
4. Logical vs. physical topology.
5. Wired topologies:

a. Star
b. Bus
c. Ring
d. Mesh

6. Wireless topologies:
    a. Mesh
    b. Ad hoc
    c. Infrastructure
7. Virtualized topologies.
8. The internet of things (IoT) technologies:
    a. Z-Wave
    b. Ant+
    c. Bluetooth
    d. NFC
    e. IR
    f. RFID
    g. 802.11

UNIT II - Network Ports and Protocols (2 Hours)

Learner Outcomes:

Upon successful completion of this unit, you will be able to:

1. Differentiate among the various networking ports and protocols
2. Distinguish between connection-oriented verses connectionless protocols
3. Justify choosing a specific networking port or protocol for facilitate communication

Content:

1. Networking ports and protocols:
    a. SSH 22
    b. DNS 53
    c. SMTP 25
    d. SFTP 22
    e. FTP 20, 21
    f. TFTP 69
    g. TELNET 23
    h. DHCP 67, 68
    i. HTTP 80

j. HTTPS 443
k. SNMP 161
l. RDP 3389
m. NTP 123
n. SIP 5060, 5061
o. SMB 445
p. POP 110
q. IMAP 143
r. LDAP 389
s. LDAPS 636
t. H.323 1720
u. ICMP
v. UDP
w. TCP
x. IP

2. Connection-oriented vs. connectionless protocols.
3. Choose specific networking port or protocol.

UNIT III - OSI and TCP/IP Model Fundamentals (2 Hours)

Learner Outcomes:

Upon successful completion of this unit, you will be able to:

1. Describe the purpose of the OSI model.
2. Summarize the functions of each layer of the OSI model.
3. Identify the network devices, applications, protocols and services that are associated with each layer of the OSI model.
4. Summarize the functions of each layer of the TCP/IP model.
5. Make a critical comparison between the OSI and the TCP/IP model.

Content:

1. OSI model.
2. Layers of the OSI model:
   i. Layer 1- Physical
   ii. Layer 2 - Date link
   iii. Layer 3 - Network
   iv. Layer 4 - Transport
   v. Layer 5 - Session
   vi. Layer 6 - Presentation
   vii. Layer 7 - application
3. Devices, applications, protocols and services working at each layer of the OSI model.
4. Layers of the TCP/IP model:
   a. Application Layer
   b. Transport Layer
   c. Internet Layer
   d. Network Access Layer

5. OSI vs. TCP/IP model

UNIT IV - Concepts & Characteristics of Routing and Switching Technology (12 Hours)

Learner Outcomes:

Upon successful completion of this unit, you will be able to:

1. Compare and contrast the various types of network traffic properties.
2. Analyze the various methods and technologies which are used to produce networking segmentation and the properties of various types of interfaces.
3. State three (3) advantages and three (3) disadvantage for the use of network routing.
4. Differentiate between routed and routing protocols, giving examples of each.
5. Distinguish between distance vector and link-state routing protocols.
6. Identify at least four (4) characteristics of types of distance vector routing protocols.
7. Identify at least four (4) characteristics of types of link-state routing protocols.
8. Give clear reasons for selecting one or more types of routing protocols to route network traffic over a given network.
9. Compare and contrast among, static, dynamic and default routing types.
10. Describe how types of IPv6 concepts impact networking routing and switching.
11. Criticize how traffic shaping, QoS, Diffserv and Cos technology influence the performance of a networking transmissions.
12. Explain the main differences between NAT and PAT technologies.
13. Describe how the implementation of port forwarding and access control list technology can minimize network intrusion.
14. Explain any four (4) primary functions of distributed switching technology.
15. Compare and contrast packet switching with circuit switching networks.
16. Compile a summary report outlining at least five (5) features of software defined networking.
17. Construct virtual networks to illustrate the different functionalities and operations among the types of distance vector and link-state routing protocols.

Content:

1. Properties of network traffic:
    a. Broadcast domains
    b. CSMA/CD
    c. CSMA/CA
    d. Collision domains
    e. Protocol data units
    f. MTU
    g. Broadcast
    h. Multicast
    i. Unicast
2. Networking segmentation and interface properties:
    a. VLANs
    b. Trunking (802.1q)
    c. Tagging and untagging ports
    d. Port mirroring
    e. Switching loops/spanning tree
    f. PoE and PoE+ (802.3af, 802.3at)
    g. DMZ
    h. MAC address table
    i. ARP table
3. Network routing advantages and disadvantages.
4. Routed vs. routing protocols.
5. Distance vector vs. link-state routing protocols:
    a. Distance vector routing protocols:
        i. RIPv1
        ii. RIPv2
        iii. IGRP
        iv. EIGRP
    b. Link-state routing protocols:
        i. OSPF
        ii. IS-IS
    c. Hybrid
        i. BGP
6. Characteristics of types of distance vector protocols.
7. Characteristics of types of link state protocols.
8. Selection of routing protocols

9. Static, dynamic and default routing types
10. IPv6 concepts:
    a. Addressing
    b. Tunneling
    c. Dual stack
    d. Route advertisement
    e. Neighbor discovery
11. Network performances concepts:
    a. Traffic shaping
    b. QoS
    c. Diffserv
    d. CoS
12. NAT vs. PAT
13. Port forwarding and access control list technology.
14. Distributed switching technology.
15. Packet switching vs. circuit switching networks.
16. Software defined networking.
17. Build networks incorporating distance vector and link-state routing protocols.

UNIT V - IP Addressing Components (6 Hours)

Learner Outcomes:

Upon successful completion of this unit, you will be able to:

1. Describe the main functions and give examples of the various types of IP addressing components.
2. Give a summary of the purposes, advantages and disadvantages of subnetting.
3. Evaluate the properties and components which make up the classful and classless subnetting schemes.
4. Perform types of classful and classless subnetting calculations.

5. Make recommendations with justifications on the most satiable subnetting class/classes which should be assigned to a given network.
6. Evaluate practically how address assignments are done on a LAN.
7. Perform address assignments on a LAN/WAN

Content:

1. IP addressing components:
    a. Private vs. public
    b. Loopback and reserved
    c. Default gateway
    d. Virtual IP
    e. Subnet mask
2. Network subnetting
3. Network subnetting classes:
    a. Classful:
        i. Classes A, B, C, D and E
    b. Classless:
        i. VLSM
        ii. CIDR notation (IPv4 vs. IPv6)
4. Subnetting calculations.
5. Recommendations of satiable subnetting class/classes.
6. Address assignments:
    a. DHCP
    b. DHCPv6
    c. Static
    d. APIPA
    e. EUI64
    f. IP reservations

UNIT VI - Wireless Technologies and Configurations (2 Hours)

Learner Outcomes:

Upon successful completion of this unit, you will be able to:

1. Outline the types of 802.11 standards, speeds and frequencies.

2. Prepare an analytic review report, of no less than 500 words, on three types of cellular technology.
3. Differences between the 2.4 GHz and 5GHz wireless frequencies, range and bandwidths.
4. Describe how various wireless technology properties influence the configuration and performance of a wireless network.

Content:

1. 802.11 standards, speeds and frequencies.
2. Cellular technology:
    a. GSM
    b. TDMA
    c. CDMA
3. 2.4 GHz vs. 5GHz frequencies
4. Wireless technology properties:
    a. Speed and distance requirements
    b. Channel bandwidth
    c. Channel bonding
    d. MIMO/MU-MIMO
    e. Unidirectional/omnidirectional
    f. Site surveys

UNIT VII - Cloud Concepts and their Purposes (1 Hour)

Learner Outcomes:

Upon successful completion of this unit, you will be able to:

1. Explain the term cloud computing.
2. Differentiate among the types of cloud delivery services models.
3. State three (3) similarities and three (3) differences of cloud private, public and hybrid.
4. Compare the types of technologies which are facilitated by the cloud.

Content:

1. Cloud computing definition.

2. Cloud delivery services models:
    a. SaaS
    b. PaaS
    c. IaaS
3. Cloud private, public and hybrid:
    a. Private
    b. Public
    c. Hybrid
4. Technologies facilitated by the cloud:
    a. Connectivity methods.
    b. Security implications/considerations.
    c. Relationship between local and cloud resources.

UNIT VIII - Network Services Functions (3 Hours)

Learner Outcomes:

Upon successful completion of this unit, you will be able to:

1. Describe the functions of the various types of DNS services.
2. Demonstrate any three (3) functions of a DNS service on a network sever.
3. Describe types of DHCP services.
4. Configure any five (5) DHCP services on a network sever.
5. Explain the primary functions of NPT with the aid of diagrams.
6. Illustrate the operation of an IPAM on a DNS and DHCP.

Content:

1. Types of DNS services:
    a. Record types:
        i. A, AAAA
        ii. TXT (SPF, DKIM)
        iii. SRV
        iv. MX
        v. CNAME
        vi. NS
        vii. PTR

b. Internal external DNS.
c. Third-party/cloud-hosted DNS.
d. Hierarchy.
e. Forward vs. reverse zone.

2. Show DNS services on a network sever.
3. Types of DHCP service:
    a. MAC reservations
    b. Pools
    c. IP exclusions
    d. Scope options
    e. Lease time
    f. DHCP relay/IP helper
4. Show DHCP services on a network sever.
5. Functions of NPT.
6. Operation of an IPAM.

UNIT IX - Network Cabling Solutions (5 Hours)

Learner Outcomes:

Upon successful completion of this unit, you will be able to:

1. Distinguish between Plenum and PVC cables.
2. Describe characteristics of various media types, including; physical structure, capacity (bandwidth and throughput), cost and ease of installation.
3. Explain how transmission factors such as noise, attenuation, delay distortion, transmission delay, propagation delay and interference affect transmission rates of various media types.
4. Justify choice of media type selection to be used in specific networking environment or situation
5. Create a descriptive chart, including label images and information on types of network connectors.
6. Compare the functionalities of types of transceivers.
7. Compare the function of types of network termination points.
8. Characterize types of network copper cable standards.

9. Differentiate among the types of copper termination standards.
10. Recommend the most appropriate type of copper cables and termination points to be used in a stated networking environment or situation.
11. Evaluate the types of Ethernet deployment standards.
12. Build and test straight-through and crossover network cables.

Content:

1. Plenum vs. PVC cables.
2. Network media types:
    a. Copper:
        i. UTP
        ii. STP
        iii. Coaxial
    b. Fiber:
        i. Single - mode
        ii. Multimode
3. Media transmission factors:
    a. Noise
    b. Attenuation
    c. Delay distortion
    d. Transmission delay
    e. Propagation delay
    f. Interference
4. Choice of media type selection.
5. Connector types:
    a. Copper:
        i. RJ-45
        ii. RJ-11
        iii. BNC
        iv. DB-9
        v. DB-25
        vi. F-type
    b. Fiber:
        i. MTRJ
        ii. LC
        iii. ST
        iv. SC
            1. APC
            2. UPC
6. Transceivers:
    a. SFP
    b. GBIC

c. SFP+
d. QSFP
e. Characteristic of fiber transceivers:
    i. Bidirectional
    ii. Duplex

7. Termination points:
    a. 66 block
    b. 110 block
    c. Patch panel
    d. Fiber distributional panel
8. Copper cable standards:
    a. Cat 3
    b. Cat 5
    c. Cat 5e
    d. Cat 6
    e. Cat 6a
    f. Cat 7
    g. RG-6
    h. RG-59
9. Copper termination standards:
    a. TIA/EIA 568a
    b. TIA/EIA 568b
    c. Crossover
    d. Straight-through
10. Recommend types of copper cables and termination points.
11. Ethernet deployment standards:
    a. 100BaseT
    b. 1000BaseT
    c. 1000BaseLX
    d. 1000BaseSX
    e. 10GBaseT
12. Build and test straight through and crossover cable.

UNIT X - Network Devices (4 Hours)

Learner Outcomes:

Upon successful completion of this unit, you will be able to:

1. Explain the functions of types of common networking devices.
2. Illustrate, physically or virtually, the operations of these devices in local area networks setting.
3. Explain the function of types of advanced networking devices.
4. Design networking architectures to include these advanced networking devices.
5. Evaluate which device(s) would be most suitable to be use to optimize network performance in a given situation.

Content:

1. Common networking devices:
    a. Firewall
    b. Modems
    c. Router
    d. Switch
    e. Hub
    f. Bridge
    g. VoIP endpoint
    h. Media converter
    i. Wireless access point
    j. Wireless range extender
2. Show network devices in local area networks setting.
3. Advance Networking Devices:
    a. Multilayer switch
    b. Wireless controller
    c. Load balancer
    d. IDS/IPS
    e. Proxy server
    f. VPN concentrator
    g. AAA/RADIUS server
    h. UTM appliance
    i. NGFW/Layer 7 firewall
    j. VoIP PBX
    k. VoIP gateway
    l. Content filter
4. Design networking using advanced networking devices.
5. Optimize network performance with networking devices.

UNIT XI - Virtualization and Network Storage Technologies (2 Hours)

Learner Outcomes:

Upon successful completion of this unit, you will be able to:

1. Describe the functions of types of virtual networking components.
2. Design small networks incorporating virtual networking components.
3. Analyze the types of network storages.
4. Contrast network connection types.

Content:

1. Virtual networking components:
    a. Virtual switch
    b. Virtual firewall
    c. Virtual NIC
    d. Virtual router
    e. Hypervisor
2. Design networks using virtual networking components:
    a. Virtual switch
    b. Virtual firewall
    c. Virtual NIC
    d. Virtual router
    e. Hypervisor
3. Network storages:
    a. NAS
    b. SAN
4. Network connection types:
    a. FCoE
    b. Fibre Channel
    c. iSCSl
    d. InfiniBand
    e. Jumbo frame

UNIT XII - WAN Technologies (2 Hours)

Learner Outcomes:

Upon successful completion of this unit, you will be able to:

1. Distinguish among WAN technologies service types.
2. Characterize the types of transmission mediums.
3. Identify at least five (5) characteristics of each listed network service type.

4. Compare types of network terminations.

Content :

1. Service types:
    a. ISDN
    b. T1 & T3
    c. E1 & E3
    d. OC-3 & OC-192
    e. DSL
    f. PRI
    g. Dial-up
    h. Cable broadband
    i. Metropolitan Ethernet
2. Transmission mediums:
    a. Satellite
    b. Copper
    c. Fiber
    d. Wireless
3. Characteristics of network service:
    a. MPLS
    b. ATM
    c. Frame relay
    d. PPPoE
    e. PPP
    f. DMVPN
    g. SIP trunk
4. Network terminations:
    a. Demarcation point
    b. CSU/DSU
    c. Smart jack

NETWORKING AND COMMUNICATION TECHNOLOGY LABS - 30 Hours

Lab No.	Lab Name	Lab Objective	Lab Duration
1	Routing and Switching	• You will be able to construct, configure and examine the operations of routing protocols such as: RIP, OSPF, EIGRP, BGP using a range of networking hardware, switches routers, wireless technologies, computers, etc. on any of the recommended virtual software simulator platforms. At the end they should compile and submit a lab report with evidence of each activity.	6 Hours
2	Networks and Topologies	• You will be able to construct, configure and examine the operations of the types of networks and topologies which are covered in unit 5 above. The composition of these constructions should include a range of networking hardware, switches, routers, wireless technologies, computers, etc. on any of the recommended virtual software simulator platforms. At the end they should compile and submit a lab report with evidence of each activity.	6 Hours
3	Network Services	• You will be able to install and configure the latest server on a virtual software platform. On this sever they should configure any three (3) DNS services, five (5) DHCP services and one NAT function which were covered in unit 8 above. At the end they should compile and submit a lab report with evidence of each activity	6 Hours
4	Network Cabling	• You will be able to build and test straight and cross over network cable using cat 5 or Cat 6 cables, RJ45 ends, crimping tools, cable testers, etc. They should also demonstrate how to terminate these cables in a patch panel or a 66/110 block. At the end they should compile and submit a lab report with evidence of each activity	6 Hours
5	Networking Virtualization and Storage	• You will be able to construct, configure and examine the operations of the type of virtualized campus network for their college which should include elements from all 12 units in this course. The network must also include both primary and cloud storage components coupled with strong security. At the end they should compile and submit a lab report with evidence of each activity. NB, this report most include justifications for the choices of each component use in the construction.	6 Hours

METHODS OF DELIVERY

1. Tutorials
2. Simulations
3. Practical Labs
4. Case Studies
5. Discussions
6. Guest lecturers
7. Demonstration

Assessment and Evaluations. In Course

4	-	Practical Labs 10 % each	=	40%
1	-	Mid module Quiz	=	10%
1	-	Individual Networking Presentation	=	10%
			=	60%
1	-	Final Examination	=	40%
				100%

- ***NB You will complete any four (4) of the five (5) stated labs on the Networking and Communication Technology (CSYS1208) course outline or a combination of any four (4).***

- ***The individual networking presentation must be based on a computer network which he/she have designed, on a given case scenario by the course instructor.***

Recommend Software:

1. Cisco Packet Tracer
2. VMware Workstation
3. Virtual Box/ VMware Player
4. Sharon Tools
5. Xenserver
6. NetSim
7. Google Cloud Platform
8. TestOut LabSim
9. Aws - Amazion Web Services
10. Boson NetSim 11 Network Simulator
11. GNS3 -Design and Configure
12. Wireshark Monitor

RESOURCE MATERIAL:

Prescribed Text Books:

Meyers, (22 Jun 2018). M. *CompTIA Network+ Certification All-in-One Exam Guide*, 7th E, (Exam N10-007).

Wallace, K. (2015). *CompTIA Network+ N10-006 Authorized Cert Guide.* Pearson.

Recommended Text Books:

Beasley, S J., Nilkaew, P. (2018) *Networking Essentials:* A CompTIA Network+ N10-007 Textbook.

FitzGerald, J. (2014). *Business Data Communications and Networking*. (latest ed.). Indiana University. ISBN-13: 978-1118.

Other online resources:

https://www.**ebscohost**.com

www.springerlink.com/books

THE COUNCIL OF COMMUNITY COLLEGES OF JAMAICA

COURSE NAME:	Oral Communication
COURSE CODE:	COMM2301
CREDITS:	3
CONTACT HOURS:	45 (45 hours theory)
PRE-REQUISITE(S):	Communication I (COMM1101) Communication II (COMM1202)
CO-REQUISITE(S):	None
SEMESTER:	

COURSE DESCRIPTION:

The focus of this course is to help learners improve speech habits and develop strategies for effective oral communication.

COURSE OUTCOMES:

Upon successful completion of this course, learners will be able to:

1. apply effective listening to a variety of oral presentations.
2. demonstrate command of presentation skills in a variety of oral presentations.
3. generate a speech appropriate to a given situation.
4. integrate non-verbal components in a variety of oral presentations.
5. respond critically to your and other's oral presentations.

UNIT I - Listening (4 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. describe the basic elements of effective listening.
2. assimilate information aurally.

Content:

1. The difference between hearing and listening.
2. The four (4) types of listening.
3. The listening process.
4. Effective listening techniques.

UNIT II – Voice Production (6 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. manipulate their vocal instrument to communicate their speeches effectively.
2. identify the vocal components of given speeches.

Content:

1. Breath and voice production.
2. Management of emotional anxiety.
3. Components of vocal expression.
    a. Pace
    b. Projection
    c. Inflection (stressing)
    d. Pronunciation (articulation) and diction (enunciation)
    e. Vowel and consonant sound

UNIT III – Speech Composition (15 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. compose different types of speech.
2. deliver different types of speech.

Content:

1. Types of speech.
    a. Extemporaneous, manuscript, memorized, impromptu.

2. Speech purpose.
    a. Persuade
    b. Inform
    c. Entertain
3. Creating speeches for different occasions.
4. Analyzing the situation.
5. Selecting the right medium.
6. Adapting to your audience.
7. Planning and delivery of special occasion speeches.
    a. Welcome
    b. Introduction
    c. Vote of thanks
    d. Toast
8. Planning and delivery of keynote speeches.
    a. Choosing a topic.
    b. Creating an outline.
    c. Finding and incorporating sources.
    d. Using rhetorical strategies.
        i. Repetition, rhetorical questions
        ii. Word choice
        iii. Appeals (logos-logic, ethos-ethics, pathos-emotion)

UNIT IV – Speech Delivery (15 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. devise an effective speech delivery plan.
2. incorporate various non-verbal components to improve speech delivery.

Content:

1. Non-verbal delivery component of speech delivery.
    a. Para-linguistics.
        i. Gestures
        ii. Facial expression
        iii. Artefacts- props, dress
        iv. Posture

v. Proxemics

b. Choosing your presentation method.
c. Practicing your delivery.
d. Overcoming anxiety.
e. Visual aids.
   ii. Power Point presentations
   iii. Charts/banners

METHODS OF DELIVERY:

1. Lectures
2. Demonstrations
3. Discussions
4. Group Work
5. Presentations
6. Speeches

METHODS OF ASSESSMENT AND EVALUATION:

1. Continuous Assessment

Rubric for Oral Presentation

INTRODUCTION	**5**	**4**	**3**	**2**	**1**	**SCORE**
	Introduction is new, original and intelligent at a level appropriate to the audience.	Gets audience attention immediately by starting with a statement/ relevant humour	Makes the audience curious to hear about the topic	Is underdeveloped and irrelevant	No Introduction used.	
MAIN POINT	**9-10**	**7-8**	**5-6**	**3-4**	**1-2**	
	Is fully developed and organized and moves into the topic from Introduction easily	Clearly addresses the question and focuses on the topic	Not always clear and is developing	Difficult to identify and does not emerge in the presentation	No main point used	
SUPPORTING MATRIALS	**9-10**	**7-8**	**5-6**	**3-4**	**1-2**	
	All supporting materials are backed by strong evidence displaying a superior control of the presentation	Logical and relevant, backs all topics with examples	Lacks originality or adequate development	Generalized or inappropriate with no relevance to the topic	No supporting materials used	
TRANSITORY POINT	**5**	**4**	**3**	**2**	**1**	
	Transitions from one topic to another	Discusses pre-prepared sub-	Divides the topic into three or four	Transitions from one point	No transitory point used	

	is very smooth and natural	topics in a logical order	sub-topics and moves between them randomly	to another is not coherent		
VOCAL DELIVERY	**5**	**4**	**3**	**2**	**1**	
	Delivery appears spontaneous throughout; notes may assist but do not interrupt or interfere with delivery	Appropriate pronunciation is maintained. Speech is spontaneous throughout; notes may assist the speaker but do occasionally interrupt the flow	Speech is hampered by occasional lazy articulation such as slurring or run-together words appearing to be spontaneous	Inappropriate or ineffective articulation, which disrupts communication with the audience	The speaker fails to communicate and is not intelligible	
EFFECTIVE LANGUAGE	**9-10**	**7-8**	**5-6**	**3-4**	**1-2**	
	Clear and distinctive words, expressions, and sentence structures; rapt audience attention	Clear word choices and expressions; no grammatical errors	Generally clear delivery; minor articulation problems, such as but not limited to, slurring or running words together	Muddled meaning; distracting in sentence structure or word usage	Consistently incorrect usage of words or phrases – and /or – offensive language	
OVERALL ORGANIZATION	**5**	**4**	**3**	**2**	**1**	

	Clear purpose; exceptionally well organized, developed and supported ideas	Main idea clear with relevant examples and smooth flow	Main idea evident; however, weak organizational structure	Ideas not focused or developed; unclear purpose	No organization is evident	
CONCLUSION	**5**	**4**	**3**	**2**	**1**	
	Outstanding topic review; strong sense of closure	Satisfying review of highlights	Acceptable work needing additional development	Abrupt, ending without connection to subject	No conclusion	
TOTAL						

1. When the subject does not use any of the necessary criteria.
2. The subject makes an effort but fails.
3. Acceptable: When the subject meets the basic requirement.
4. Good: When the subject is well-prepared and hence would do very well in a prepared presentation.
5. Excellent: When the subject is a natural communicator and can talk about the topic with ease.

RESOURCE MATERIAL:

Recommended:

Lucas, S. (2004). The art of public speaking, Boston: McGraw-Hill.

Additional Reading

Alder, R. B., Proctor, R. F., Lawrence, B. (2004). Interplay. The process of interpersonal communication. 9th edition. Oxford: Oxford University Press.

THE COUNCIL OF COMMUNITY COLLEGES OF JAMAICA

COURSE NAME:	Probability and Statistics
COURSE CODE:	MATH1206
CREDITS:	3
CONTACT HOURS:	45 (45 hours theory)
PRE-REQUISITE(S):	CSEC Mathematics **OR** Equivalent
CO-REQUISITE(S):	None
SEMESTER:	

COURSE DESCRIPTION:

This course introduces learners to the language, logic and application of probability and statistics. It further enables students to apply the principles of statistics to solving problems and develop decision making skills. The course also shows students how to present data to other people in ways that are clear and accurate using statistical software packages.

COURSE OUTCOMES:

Upon successful completion of this course, learners will be able to:

1. explain the usefulness of probability in decision making.
2. explain the principles of Hypothesis testing and its applications.
3. discuss issues and problems associated with probability and statistics.
4. produce appropriate tabular and graphical formats for displaying statistical data.
5. use probability and statistical techniques to solve problems and make decisions.
6. use statistical software tools to solve probability and statistical problems.
7. interpret statistical data.

UNIT I - Probability (9 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. define ‘probability’.

2. define the terms:
    a. sample space
    b. sample points
    c. events
    d. random events
    e. outcomes
    f. equally likely outcomes

3. state the axioms of probability:
    a. explain the three (3) approaches to probability.
    b. explain the Law of Large Numbers.
    c. explain:
        i. mutually exclusive events.
        ii. independent events.
        iii. dependent events (in relation to conditional probability) $P(A \cap B) = P(A)$ $P(B|A)$.
    d. apply principles of probability to the solution of problems involving events that are mutually exclusive, dependent or independent.
    e. solve problems using probability tree diagrams (2 levels).
    f. apply total law of probability to solve problems.
    g. calculate a probability using Bayes' Theorem.

Content*:*

1. Axioms of probability.
2. Approaches to probability:
    a. Classical Approach
    b. Subjective Approach
    c. Relative Frequency Approach (Law of Large Numbers)
3. Addition Rule (consider mutually exclusive events).
4. Multiplication Rule (independent and dependent events.
5. Tree diagrams (2 levels).
6. Total Law of Probability.
7. Bayes' Theorem.

UNIT II – Probability Distributions (8 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. state the meaning of a probability distribution function P(X=*x*).
2. calculate:
   a. expectation for a given discrete probability distribution.
   b. variance for a discrete probability distribution.
   c. standard deviation for discrete probability distribution.
3. calculate the probabilities for a discrete probability distribution including binomial and Poisson.
4. calculate the standard normal and Student's t variables (z–value and t–value).
5. use the standard normal distribution or the Student's t distribution tables to calculate probabilities/areas under the standard normal curve.
6. apply the normal approximation to the binomial (and Poisson) distribution.

Content:

1. Discrete distribution:
   a. Simple discrete distribution.
   b. Binomial distribution.
   c. Poisson distribution.
2. Continuous distribution – Normal distribution, Student's distribution.
3. Normal Approximation to the Binomial (and Poisson) distribution (continuity correction factor).

UNIT III – Sampling Theory (6 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. describe the methods used in obtaining samples for statistical analysis.
2. determine when it is necessary to use a sample frame.
3. outline the steps involved in each of the six methods used in obtaining a sample for statistical analysis.
4. state the advantages and disadvantages for each sampling method.

5. use a table of random numbers to select a sample.
6. explain the concept of sampling theory and the relationship between sample and population parameters (means and variances).
7. apply the Central Limit Theorem to large samples.
8. estimate the sample mean and sample variance (standard error).
9. determine confidence intervals for the means of large samples.

Content:

1. Sampling methods:
   a. Simple random sample.
   b. Stratified random sample.
   c. Multistage random sample.
   d. Systematic random sample.
   e. Cluster sample.
   f. Quota sample.
2. Central Limit Theorem.
3. Confidence interval of ***the mean*** for large samples.

UNIT IV – Hypothesis Testing (10 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. conduct hypothesis tests using the normal and student's t distributions.

2. conduct hypothesis tests involving:
   a. one sample mean.
   b. one sample proportion.
   c. two sample means.
   d. two sample proportions.

Content:

1. Hypothesis tests using Z distribution and t distribution:
   a. One sample mean.
   b. One sample proportion.
   c. Two sample means.
   d. Two sample proportions (pared and independent).

UNIT V – Regression and Correlation (6 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. explain the concept of correlation.
2. plot scatter diagrams of bi-variate data and identify the relationship between these diagrams and the coefficients of correlation.

3. calculate the product moment coefficient of correlation and interpret the value obtained.
4. calculate and interpret the coefficient of determination.
5. calculate the slope and intercept using the method of least squares.
6. determine the least squares regression line (or equation) and interpret the values.
7. use the least squares regression equation for estimation purposes.

Content:

1. Linear regression and correlation:
   a. Definition
   b. Scatter diagram
   c. Slope and intercept
   d. Product moment correlation coefficient
   e. Coefficient of determination
   f. Estimate using least square regression

UNIT VI – Introduction to statistical software (3 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. use statistical software in probability and statistical problem (PHSTAT^2 , Microsoft Excel).
2. apply statistical software to solve basic problems in probability, probability distribution, gaming theory, regression and correlation.
3. discuss the advantages and disadvantages of statistical software packages.

Content:

1. Microsoft Excel, Phstat, PSPP, Genstat.
2. Advantages and disadvantages.
3. Problem solving using software.

METHODS OF DELIVERY:

1. Lectures
2. Tutorials
3. Demonstrations
4. Discussions
5. Group Work
6. Projects
7. Research

METHODS OF ASSESSMENT AND EVALUATION:

1. Common Coursework 20%
2. Internal Tests 20%
3. Final Examination 60%

(40 MCQ's 1 mark each and 5 ETQs 20 marks each to choose 3)

RESOURCE MATERIAL:
Prescribed:

Newbold P., William C., & Thorne B.(2009) S*tatistics for business and economics*, (7th ed.).

NJ: Prentice Hall.

Spiegel M., & Stephens, L. (2007). *Schaum's outline series statistics* (4th ed.).

Schaum's Outlines OH: McGraw Hill.

Recommended:

Bluman, A.(2007). *Elementary statistics – a step by step approach* (6th ed.). OH: McGraw Hill.

Crawshaw, J. & Chambers, J. (2001). *A concise course in A - level statistics* (4th ed.).UK: Nelson

Thornes Publishing.

Evans, O. (1992) *Statistics made simple for students of social science and management.* (Rev. ed.)

Triola, M.F. (2008). *Essentials of Statistics*. NJ: Prentice Hall.

Other online resources:

https://www.**ebscohost**.com

THE COUNCIL OF COMMUNITY COLLEGES OF JAMAICA

COURSE NAME:	Small Business Management
COURSE CODE:	MGMT2405
CREDITS:	3
CONTACT HOURS:	75 hours (45 hours practical, 30 hours theory) **30 hours Theory – Semester I** **45 hours Practical – Semester II**
PRE-REQUISITE(S):	None
CO-REQUISITE(S):	None
SEMESTER:	

COURSE DESCRIPTION:

This course is designed to provide learners with an understanding of the requisite tools used in small business management. It will expose learners to the concept of entrepreneurship and the techniques used in launching a small business. In addition, this course will enable learners to understand and apply principles that are critical to developing, growing and managing a new business; the learner should demonstrate mastery by development of a business plan.

COURSE OUTCOMES:

Upon successful completion of this course, learners will be able to:

1. explain the steps to be taken in opening a small business.
2. explore the basic principles required to run a business.
3. develop a business plan.
4. use information, projections logic and critical thinking to recognize an opportunity and solve small business problems.
5. demonstrate the characteristics required to be a successful entrepreneur.
6. apply financial information in business decision making.
7. evaluate the contribution of small business to economic development.
8. simulate the set up a small business operation.

UNIT I – The Foundation of Entrepreneurship (3 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. explain the concept of a small business.
2. evaluate the necessary characteristics of a successful entrepreneur and its benefits.
3. describe the cultural diversity of entrepreneurship.
4. describe the important role small business play in our nation's economy.
5. research two (2) successful small businesses in your country.
6. explain five (5) common mistakes made when starting a business.
7. identify the key success factors in operating a business.
8. explore online resources for business opportunities.
9. examine risk management in small business.
10. identify the social and ethical issues facing the entrepreneurs.
11. research new and emerging trends in business entrepreneurship.

Content:

1. Definition of a small business.
2. Characteristics of an entrepreneur and its benefits.
3. Cultural diversity of entrepreneurship - Young entrepreneurs, women entrepreneurs, and part-time entrepreneurs, home based entrepreneurs, family business.
4. Successful small business example (hair salon, dressmaker, tailor etc.)
5. Mistakes to avoid when starting a new business.
6. Key factors: how to avoid business failure.
7. Online resources: Facebook, Google, Internet etc.
8. Managing risks in small businesses: use of insurance, critical staff etc.
9. Social and ethical issues in small businesses.
10. New and emerging trends in business entrepreneurship.

UNIT II – The Creative process and innovation (3 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. explain the differences among creativity, innovation and entrepreneurship.
2. describe why creativity and innovation are such integral parts of entrepreneurship.
3. explain how entrepreneurs can enhance their own creativity and that of their employees.
4. describe the steps in the creative process.

5. discuss techniques for improving the creative process.
6. describe the protection of intellectual property through patents, trademarks and copyrights.

Content:

1. Creating innovation and entrepreneurship.
2. Creativity, a necessity for survival.
3. The creative process -preparation, investigation, transformation, incubation, illumination, verification and implementation.
4. Barriers to creativity.
5. Techniques to enhance creativity.
6. Intellectual property.
   a. Patents
   b. Trademarks
   c. property rights

UNIT III – Strategic Planning for Small Business (6 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. explain the concept of strategic planning.
2. construct a vision statement and mission statement.
3. conduct a SWOT analysis/feasibility study on a small business.
4. discuss the relationship between business strategies and the firm's mission.
5. identify the strategic roles of marketing, HRM and financing for small enterprise.
6. identify ways in which information communication technologies (ICTs) are used by entrepreneur to gain competitive advantages.
7. explain why "*going global*" has become an integral strategy of small enterprises.
8. demonstrate networking skills to build customer loyalty.
9. use customer service techniques as a strategic tool for small businesses.

Content:

1. Definition and purpose of a vision and mission statements.
2. Designing mission and vision statements.
3. Components of SWOT analysis/feasibility study and completing a SWOT Analysis/feasibility study on a specific small business in your country.

4. Relationship between business strategies and the firm's mission.
5. Strategic roles: marketing, HRM and financing for small enterprises.
6. Obtaining competitive advantages in the market place using ICTs.
7. Strategy of "*going global"*.

8. Building customer loyalty through networking skills.
9. Customer service as a strategic tool.

UNIT IV – Types of Ownership and Legal Requirements (4 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. list the three (3) major forms of business ownership.
2. discuss the advantages and the disadvantages of the corporation, Limited Liability Company, the professional corporation and the joint venture.
3. identify the laws governing the establishment of a business in Jamaica.
4. explain the benefits and the drawbacks of buying a franchise/an existing business/starting a new business.
5. outline the major trends shaping franchising business arrangements.
6. outline the steps involved in buying an existing business.
7. describe the various techniques used to determine the value of a business.
8. explain the forces that drive growth in a small business.
9. identify the legal requirements to start/operate a small business.
10. outline the various laws and regulations that impact employer and employees in a small business.

Content:

1. The sole proprietorship, partnership, corporation, joint venture etc: Advantages and disadvantages of each.
2. Laws governing the establishment of a business in Jamaica.
3. Advantages and drawbacks of buying an existing business/franchise/starting a new business.
4. Trends in franchising business arrangements.
5. Procedures to follow in buying an existing business.
6. Techniques used in valuing a business.
7. Growth strategies for small entrepreneurs/businesses.
8. Legal requirements to start/operate a small business.
9. Laws and regulations that affect employer and employees relationship.

UNIT V – Small Business Marketing (4 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. explain terminologies relating to marketing.
2. describe the principles of building a Guerrilla Marketing Plan and the benefits of preparing one.
3. explain how small businesses can pinpoint their target market.
4. discuss the role of market research in building a marketing plan and outline the market research process for small businesses.
5. discuss the marketing opportunities the World Wide Web offers entrepreneurs and how to take the best advantage of them.
6. discuss the "four P's" of Marketing and their applications to a small business operation.
7. determine the right marketing mix strategy for a small business.
8. investigate how to give a small business an online marketing presence.

Content:

1. Definition of marketing terms: marketing, marketing mix, 4P's, target market, etc.
2. Building a Guerrilla Marketing Plan and preparing a Guerrilla Marketing Plan.
3. Pinpointing the target market.
4. Determining customer needs and wants through market research; market research process.
5. Using marketing opportunities provided by the internet.
6. The marketing mix:
   a. Product
   b. Price
   c. Place
   d. Promotion
   e. Application of 4P's to small business operations
7. Internet as a marketing tool: ecommerce, customer support etc.
8. Putting a small business online.

UNIT VI – Financial Planning (9 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. explain the importance of preparing a financial plan.
2. describe the various sources of equity capital available to entrepreneurs.
3. describe the various forms of loan programmes available to entrepreneurs.

4. outline the general process required for accessing a loan.
5. describe different means of acquiring start-up capital.
6. describe the steps in preparing a basic financial statement.
7. create projected (pro-forma) financial statements.
8. conduct break even analysis for a business and pricing strategies.
9. explain the importance of cash management.
10. create a cash budget.
11. prepare business records: accounts, employee taxes etc.
12. use the internet to find financial resources online: example – freeware and mobile applications, etc.

Content:

1. Financial planning as a strategic tool for small enterprises.
2. Sources of equity capital, loans, government small business assistance programmes, international lending agencies and grants, etc.
3. Basic Financial Statements - balance sheet, income statement, statement of cash flow.
4. Pro-forma financial statements.
5. Sources of equity financing: private and public funding: Bank, Credit union, etc.
6. Break-even analysis and pricing strategies.
7. Cash management: budget preparations; role of entrepreneur.
8. Cash budget preparation.
9. Business record keeping – accounts, employee, taxes, use of software etc.
10. Finding financial resources online.

UNIT VII – HRM and Employees Relations for Small Business (3 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. explain the terms human resource management (HRM) and employee's relation and their importance in a small business.
2. outline the main functions of HRM.
3. examine how HRM is use as a strategic tool by small entrepreneurs.
4. identify the benefits of education and training on human resource in small enterprises' success.
5. show how an entrepreneur uses wage, salary and benefits policies to motivate employees.
6. assess the use of two (2) Motivation Theories on employees' performance in a small firm.

Content:

1. Definition of Human Resource Management and Employee Relations.

2. Functions of Human Resource Management:
    a. Human resource planning.
    b. Recruitment and selection.
    c. Training and development.
    d. Performance management.
    e. Compensation.
    f. Occupational health and safety.
3. HRM as a strategic tool in small business management.
4. Benefits of education and training on business success.
5. Factors that motivate employees and their use in a small business.
6. Two (2) Motivation Theories: Maslow's, Theory X and Y etc., their impact in small firm.

UNIT VIII - Develop a Business Plan for a Small Business (13 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. explain why entrepreneurs need a business plan.
2. identify the parts of a business plan.
3. develop a comprehensive business plan that will be fully completed as a final project/examination.

Content:

Business Plan Guide

Organization of the business plan components:

1. Executive summary:
    a. Summarize key items that stand on their own.
    b. Draw the reader's attention.
2. Business overview:
    a. Type of business.
    b. Demographics.
3. Business environment:
    a. Industry analysis.
    b. Target customer profile.

4. Business description:
    a. Management team.
5. Financial review:
    a. Financial forecast.
    b. Cash flow.
    c. Income statement.
    d. Balance sheet.
6. Business strategy:
    a. Business model.
7. Action plan:
    a. Next steps
    b. Benchmarks
    c. Timeframes

METHODS OF DELIVERY:

1. Lectures
2. You Tube Videos Presentation
3. Simulation
4. Case Studies and Analysis
5. Role play
6. Independent study
7. Oral report
8. Project
9. Research
10. Practical Based activities

METHODS OF ASSESSMENT AND EVALUATION: continuous assessment

1. Business Plan	40%
2. Practicum	40%
3. Assignments:	
a. Assignment 1	10%
b. Assignment 2	10%
	100%

RESOURCE MATERIAL:

Prescribed:

Bennett, K. (2010) *Starting a business in Jamaica.*

Williams, S. (2006) *The financial times guide to business start-up*. Pearson Education: UK.

Zimmerer T., Scarborough N. (2007). *Essentials of entrepreneurship and small business management* (latest ed.). NJ: Prentice Hall.

Websites:

Doing Business – measuring business regulations - http://www.doingbusiness.org/

International Council for small Businesses – http://www.icsb.org

Jamaica Business Development Corporation – http://www.jbdc.net

JAMPRO Trade and Investment Jamaica – http://ww.jamaicatradeandinvets.org

Small Business Association of Jamaica – www.sbaj.org.jm

http://entrepreneurs.about.com

http://www.bplans.com/sp/businessplans.ctm

Small Business Management

(Practicum Rubric)

RUBRIC				
UNIT & OBJECTIVE NUMBER	**Syllabus Content #**	**LEARNING OBJECTIVE**	**TOTAL MARKS POSSIBLE**	**TOTAL MARKS EARNED**
Unit				
		Opening Ceremony: Marketing material Departmental Reports Physical Presentation/ Room arrangement Deportment Punctuality Team Work Flow of Activities Display of Products **Totals marks**	4 3 2 2 1 3 3 2 **20**	
		Execution of the Business	60	
		Registration and Business startup: Certificate of incorporation	2	
		Creative presentation of the business: Layout Welcoming environment/ Customer service Accessibility	3/5/1	
		Opening and maintaining bank account for the duration of the business: (A bank account is to be opened with three members of the partnership or company namely: The Manager/ Director, Accountant, Secretary)	3	
		Management team and their job description: Each member of the management team should have a job description	2	
		Each business entity must have a General Manager and should be divided into four Departments that is: 1. Finance/Accounting 2. HRM/Personnel 3. Marketing	8	

		4. Production Performance of each department should be assessed each week.		
		Deportment: Employees should be professionally attired at all times: Uniform Name tags/ ID	7	
		Weekly meeting once per week accompanied by a report of the weeks activities	4	
		Marketing strategies employed: Advertising: Flyers, social media example Facebook, WhatsApp Creative ways to attract and get repeat customers: Bundling Discount Customer appreciation Customer of the week	6	
		Team work: all departments working cohesively to achieve the business' s goals and objectives.	4	
		HRM OPERATIONS: 1. Motivating employees: 2. Wage or salary 3. Benefits policies 4. Employee of the week	6	
		Proper accounting procedure showing the overall performance of the business: 1. Regular and accurate bookkeeping 2. Income Statement/ Profit and Loss showing whether or not the business is a viable and profitable one. 3. Statement of Financial Position/ Balance sheet showing capital contribution / shares in the business	6	
		Closing Ceremony: Deportment Departmental Reports Physical Presentation/ Room arrangement Punctuality Team Work Flow of Activities	3 5 2 2 3 3	

		Appropriateness of Guest Speaker **Total**	2 **20**	

THE COUNCIL OF COMMUNITY COLLEGES OF JAMAICA

COURSE NAME:	Web Development I (using HTML5, JAVA Script and CSS3)
COURSE CODE:	CWEB1205
CREDITS:	3
CONTACT HOURS:	105 (15 hours theory, 90 hours practical)
PRE-REQUISITE(S):	None
CO-REQUISITE(S):	None
SEMESTER:	

COURSE DESCRIPTION:

This course is designed to provide the necessary skills and training in the area of Web Design. The class will focus on web page planning, basic design, layout and construction, publishing and maintenance using HTML5, JavaScript using selected text editors.

COURSE OUTCOMES:

Upon successful completion of this course, learners will be able to:

1. define terms associated with the World Wide Web and the hypertext markup language (HTML).
2. select various tools used in developing web page.
3. utilize basic web page design principles.
4. apply design considerations that affect web page construction.
5. use various tools to create HTML5 documents.
6. appreciate the importance of image compression and various compression tools and techniques.
7. demonstrate use of advanced HTML5 scripting.

UNIT I – The Internet and the World Wide Web (7 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. discuss the history of the Internet.

2. explain the role of service providers in accessing and connecting to the Internet.
3. identify the components of a Web address.
4. explain the purpose of a Web browser.
5. distinguish between the various types of Web sites.
6. evaluate websites.

Content:

1. History of the Internet:
   a. ARPANET
   b. W3C
2. History of HTML and its versions.
   Accessing the Internet:
   a. Service Providers.
      i. Definition of service providers.
      ii. Types of service providers (Internet Service Providers, Online Service Providers).
      iii. Differentiate between ISP and OSP.
      iv. Examples of ISP and OSP.
      v. Services that each provide.
3. Uniform Resource Locator (URL):
   a. Domain names.
   b. Parts of a URL.
      i. Protocol, domain, path, filename.
   c. IP Addresses
      i. The connection between an IP address and a domain name.
4. Web browsers:
   a. Definition of web browsers.
   b. Purpose of web browsers.
   c. Evaluating web browsers.
      i. Load speed, user-friendliness, ease of use, required environment, usefulness of its search engine, browseability and organization, interactivity, connectivity, cost.
5. Web sites:
   a. Definition, purpose, types of Portal, News, Blog, Social Networking, Personal, Business/Marketing.
   b. Advantages and disadvantages of each type.
6. Evaluation of Websites.

a. Purpose; target audience; currency, appropriateness, and completeness of content; copyright issues; site map & navigation; page size – fixed or variable.

UNIT II – Web Page Formatting and Layout (22 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. discuss the concept of mark-up language.
2. outline the benefits of HTML5.
3. create web pages using various html5 structure and components.
4. validate HTML5 Pages.

Content:

1. Mark-Up Language.
   a. Concept of Mark-Up Language.
   b. Components of HTML5.
      i. Elements
2. Description of elements.
3. Block vs. Inline.
4. Attributes & values.
   Benefits of HTML5:
   a. Facilitates backward compatibility.
   b. Provides non propriety open framework (JavaScript).
   c. Invalid markup handling.
   d. Improved semantics.
5. Creating Web Page Structure.
   a. The <DOCTYPE> Identifier
      Comments.
      Basic HTML tags:
   b. html, head, title, meta, link, body, div, span
      Meta Tags:
      i. Original meta tags
   c. New Meta Tags: viewport - Width, initial-scale, user-scalable, maximum-scale
      New Semantic elements.
   d. header, nav, section, article, aside, footer, figure, figcaption,
      concept of nested tags
      Working with text
      i. Paragraphs
      ii. Line breaks

iii. Headings (h1 – h6)
iv. Horizontal Rules
v. Quotations: short, long
vi. Special tag characters
vii. Mark

e. Create Lists:
   i. Unordered
   ii. Ordered
   iii. Nested
   iv. Description

f. Create Tables:
   i. The <table> element.
   ii. Rows, Head and Cells.
   iii. Empty Cells.
   iv. Table Parts (Head, Body and Foot).
   v. Caption Alignment (left, right, top, bottom).
   vi. Colgroup.
   vii. Merging cells in columns and rows.

6. Validators:
   a. Discus at least three (3) uses of validators.
   b. Use W3C validator.

UNIT III – Multimedia and Interactivity (12 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. utilize the anchor (link) tag to create hyperlinks.
2. use images in a webpage.
3. demonstrate the functionalities of a form.
4. use audio in webpage.
5. use videos in webpage.

Content:

1. Links:
   a. Creating Links.
      i. Using the anchor (link) tag (with text and with images).
   b. Demonstrate the use of blank target attribute:
      Linking to local pages using:
      i. Relative pathnames.

c. Absolute pathnames (Advantages & disadvantages of relative or absolute pathnames).
Linking to other web documents/page.
Linking to specific places within a webpage:
   i. Creating links and anchors.

d. Linking to anchors in the same document
Mailto:
   i. from, to, subject, body.

2. Using Images:
   a. Include images in a webpage.
   b. Image types – gif, jpg, png.
   Adding an image alternate text.
   c. Adding an image title text.
   Images and Text:
      i. Text and Image Alignment.
   d. Wrapping Text Next to Images.
   Manipulating images:
      i. Adjusting image size (px and %).

3. Forms:
   a. Description of Forms.
   b. Essential Elements of a form:
      i. The form tag.
      ii. Creating form controls.

4. Input element -
   password, text (include size, autofocus, required, and maxlength of field), search, email, url, tel, number, range, date, week, month, datetime, datetime-local, time, color, hidden, file, submit, reset.

5. Textarea element in conjunction with rows and cols attributes.

6. Select element features (option, optgroup & label attribute).

7. Radio buttons, Check boxes.

8. Fieldset & Legend elements.

9. Button element.

10. Datalist:
    a. Displaying Control Labels using for attribute
    b. Creating disabled and read only controls
    c. Placeholder
    d. Autocomplete
    e. Access key attribute
    f. Meter
    g. Progress
    h. Action attribute
    i. Method attribute

j. get
k. post

11. Use audio in webpage.
    a. Demonstrate use of Audio element.
    b. Use SRC element (include audio file extensions –OGG, wav, mp3).
    c. Use controls attribute in conjunction with the audio element.
    d. Allow audio to start automatically.
    e. Allow audio to loop.
12. Use preload to control buffering of sound:
    a. Use videos in webpage.
    b. Demonstrate use of Video element.
    c. Use SRC element in conjunction with type attribute to embed video (also include video file extensions –OGG, mp4, webM).
    d. Use controls attribute in conjunction with the video element.

UNIT IV – Cascading Style Sheets (24 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. explain the term cascading style sheets.
2. distinguish among inline, embedded and external style sheets.
3. utilize style sheets to adjust the alignment and format of elements on a web page.

Content:

1. The concept of cascading style sheets.
    a. Syntax of CSS.
    b. Advantages and disadvantages of cascading style sheet.
    c. Cascading (Inheritance, Specificity and Location).
2. Types of cascading style sheets:
    a. Inline (should not be tested in Assessments).
    b. Internal (should not be tested in Assessments).
    c. External
        i. Emphasis should be made in using external CSS.
3. Utilization of style sheets in controlling page layout.
    a. Use Selectors.
        i. HTML
4. Html elements mentioned in units II and III.
5. Grouping elements - div, span.

6. Semantic elements – header, nav, section, article, aside, footer.
    i. Class
    ii. ID
    iii. Pseudo-class vs. pseudo-elements
b. Page layout
    i. Float
    ii. Clearing a float – clear property, overflow property
    iii. Width
    iv. Padding
    v. Managing position (static, absolute, relative, fixed, inherit)
    vi. Offset
c. Style text using CSS.
    i. Color - Difference between using colour name, hexadecimal, condensed hexadecimal, RGB and RGBA codes.
    ii. Alignment
    iii. Indent
    iv. Size – px, %, em, in, cm, mm, pc, ex, xx-small, x-small, small, medium, large, x-large, or xx-large.
    v. Weight
    vi. Style
    vii. Font family
    viii. Line-height
    ix. Change capitalization
    x. Text-decoration (underline, overline, line-through, none)
    xi. Shadow (text, box)
d. Style tables.
    i. Width
    ii. Borders
    iii. Cells – width, padding and spacing
    iv. Aligning tables
    v. Aligning table content
    vi. Color - background, border
e. Style links.
    i. Pseudo-classes (visited, hover, link, active, first-child, focus)
f. Style lists.
    i. List styles
g. Style Form controls
h. Style gradients
i. Format background with images
j. Transform selector
k. Transition selector
l. Box Model:
    i. Border, padding, margins, background color
m. Responsive Webpages.

i. Media queries
ii. Flexible images
iii. Flexible box layout

n. Use Design Layouts:
i. Fixed Layouts
ii. Elastic Layouts
iii. Fluid Layouts
iv. CSS Grid
v. CSS Framework

o. CSS browser prefixes
i. -moz- Firefox and browsers using Mozilla's Gecko engine.

ii. -webkit- Safari, Chrome, and WebKit
iii. -o- Opera
iv. -ms- Internet Explorer

UNIT V – Introduction to JavaScript (36 hours)

Learner Outcomes:

Upon successful completion of this unit, learners will be able to:

1. explain the purpose of JavaScript.
2. use the objects presented by JavaScript to create dynamic web pages.
3. apply their knowledge of JavaScript variables and operators.
4. describe at least five (5) control structures.
5. utilize JavaScript functions to simplify the creation of an interactive web page.
6. apply JavaScript in managing a web page.

Content:

1. JavaScript and Object Oriented Programming:
   a. Definition of JavaScript.
   b. Purpose of JavaScript.
   c. The <script> tag.
   d. Objects, properties, methods.
   e. Document Object Model (DOM).
2. Objects:
   a. Statements.
   b. Description of statements:
      Document Objects
      i. Write(), writeln()
      ii. Title

iii. GetElementByID
c. Window Objects:
d. Alert, Prompt, Confirm, Open, Close, Print
String
i. Length
ii. Substring
iii. Concat
iv. ToLowerCase
v. ToUpperCase
e. Math Objects:
i. Max
ii. Min
iii. Pow
iv. Round
v. Sqrt
f. Date:
i. GetDate
ii. GetMonth
iii. GetDay
iv. GetHours
v. GetMinutes
vi. GetFullYear
vii. GetTime

3. Variables and Operators.
a. Variables:
i. Definition.
ii. Accepted variable names.
iii. Types – string, numeric, Boolean, array.
b. Operators:
i. Arithmetic (+, -, *, /, %)
ii. Assignment (+=, -=, *=, /=, %=)
iii. Comparison (==, !=, <, >, <=, >=)
c. Perform Simple sequence Operations using variables and operators.

4. Control Structures.
a. Selection:
i. If
ii. If…else
iii. Switch
b. Iteration:
i. While
ii. Do while
iii. For
c. Array

i. Definition and purpose of an Array.
ii. Creating an array Storing values in an array.
iii. Accessing the values in an array.
iv. Modifying the values in an array.

5. Functions:
   a. User Defined
      i. Purpose
      ii. Defining a function
      iii. Calling
      iv. Returning values
      v. Passing values to a function
   b. Built-in (Events)
      i. Events
      ii. onload, onclick, ondbleclick, onmousedown, onmouseup, onmouseover, onsubmit, onreset, onselect, onmouseout, onfocus, onblur, onchange, onupload

6. Javascript Management of webpages
   a. Form Validation.
   b. Error catching.
      i. Try, catch statement.
      ii. Throw statement.
   c. Polyfilling.
      i. Respond.js, html5 shiv, cupcake.js, flashCanvas.
   d. Testing for IE browser versions.

UNIT VI – Web Hosting (should not be tested in exam but must be demonstrated in coursework) (2 hours)

Learner Outcomes:

Upon successful completion of this unit, leaners will be able to:

1. describe the concept of webserver.
2. create an account on a selected web page hosting service.
3. upload webpages to hosting service.

Content:

1. Webserver Description.
   a. Definition
   b. Reasons for webserver
2. Create hosting service.

3. Identify free webhosting sites online eg http://www.hostinger.co.uk/
   Upload webpages
   a. Use upload feature of free webserver service.
   b. Use FTP program eg Filezilla.
4. Testing a Responsive Site.
   a. Cross-Bowser Test including Resize Test.
   b. Physical Mobile Device Test.
   c. Testing on a device simulator.
      i. iOS
      ii. Android
      iii. Windows Mobile
      iv. BlackBerry OS
      v. Firefox OS

METHODS OF DELIVERY:

1. Lectures
2. Case Studies
3. Demonstrations
4. Discussions
5. Group Work
6. Projects
7. Research
8. Simulation
9. Lab Work

METHODS OF ASSESSMENT AND EVALUATION:

1.	Mid Semester (Theory -	10%
2.	In course Test 1 (practical – HTML/CSS)	10%
3.	In course Test 2 (practical – JS)	10%
2.	Common Coursework - individual	10%
3.	Common Coursework – Project	30%
4.	Final Examination (Practical)	30%

RESOURCE MATERIAL:

Prescribed:

Connolly R. Hoar R (2017). Fundamentals of Web Development (Global Edition). England: Pearson Education Ltd.

Fielding, J. (n.d) Beginning Responsive Web Design with HTML5 and CSS3, Apress Publishers.

Recommended:

Felke-Morris, T. (2017). Web development and design foundations with HTML5. (9th ed.). USA: Pearson Education Ltd.

Harris, A (2014), HTML5 & CSS3 All-in-one for Dummies. (3rd Edition), John Wiley & Sons, Inc.

Online Resources:

www.w3schools.com

http://htmldog.com

https://www.codecacademy.com/learn/learn-html

Other online resources:

https://www.**ebscohost**.com

www.springerlink.com/books

THE COUNCIL OF COMMUNITY COLLEGES OF JAMAICA

COURSE NAME:	Work Experience Program
COURSE CODE:	WOEP 1100
CREDITS:	3
CONTACT HOURS:	240 hours (minimum)
PRE-REQUISTE(S):	None
CO-REQUISTE(S):	None
SEMESTER:	

COURSE DESCRIPTION:

Work Experience (WE) is designed to provide learners with 'hands-on' experiences in a real world professional setting prior to completion of their degree program. It is intended to prepare learners for the rapidly changing social, economic and technological environment of the modern workplace and allow learners to translate theory into practice for professional growth and development. Learners will also be exposed to team-building, interpersonal, customer service, communication, decision-making and other work related skills.

COURSE OUTCOMES:

Upon successful completion of the Work Experience Program learners should:

1. transfer skills, knowledge and abilities learned in the classroom to a practical workplace settings.
2. acquire relevant work experience to enhance their employability skills.
3. demonstrate appropriate professional behaviours and effective communication in the workplace.
4. promote self-discovery through experiential learning in their respective career fields.

PROCESS

Work Experience Program applies to all learners pursuing a CCCJ's Associate or Bachelor of Science Degree. On successful completion of the following requirements learners will be awarded three (3) credits:

Course Requirements:

In order to receive credit, learners are required to complete **all** of the following:

1. Attend a **MANDATORY** session at their respective college on the Work Experience Program.

2. Placement for WE should be aligned as closely as possible to the learner's area of study in order for the experience to be relevant to his or her career choice.

3. Submit a:

    a. **Work Experience Report**, one week after the end of the work experience exercise to the Work Experience Coordinator/designated faculty supervisor.

    b. **Resume and Cover/Application Letter**, to the Work Experience Coordinator or designated faculty supervisor and the Human Resource supervisor at the work site before WE commences.

    c. **Personal Journal** to the Work Experience Coordinator/designated faculty supervisor (every three [3] weeks) on your WE.

    d. **Daily Work Log/Time Sheet** (typed) showing the dates, hours worked, description of work activities and signature of your assigned workplace supervisor. This log must cover the minimum two hundred and forty (240) hours and included in your WE Report.

    e. **Employer's Thank you Letter** on the final day of WE given to your employer/work site supervisor and a copy included in your WE Report.

    f. **Complete the required hours** - minimum of two hundred and forty (240) hours.

    g. **Fulfill all responsibilities** at the work site.

    h. **Return all work site materials** where necessary.

Evaluation:

learner performance is monitored by the employer/assigned supervisor and site visits are carried out by the work experience coordinator/designated faculty member. Evaluation of work experience report, Presentation/exhibition, work log and journal are completed by a designated faculty member.

Grading System: pass or fail. Letter grade is based on evaluation criteria of ***Section VI* Examination Grades, Points and Distribution** in the CCCJ's Curriculum Guide for the respective program.

WORK EXPERIENCE REPORT

The cover page of the Report should contain the following information: student name, duration of work experience, title of Report, name of supervisor and the location. The entire Report should be a maximum of twelve (12) pages in length (double space).

The content and format of the Report is outlined below:

Registered Name of Business: The official trading name of the business.

Job Title(s): The position(s) assigned during the work experience tenure.

Location: The address of the work site you did the WE.

Responsibilities: Describe your responsibilities during your work experience tenure.

Skills and Knowledge:

1. Describe the skills and knowledge required to fulfil your WE responsibilities.
2. Discuss how your knowledge base and personal skill set evolved during your WE.
3. Explain how your new knowledge and skills are relevant to your academic studies and future goals.
4. What strengths and weaknesses were uncovered by the experience and how will you improve on your strengths or address your weaknesses?
5. Describe how your thinking about career choices has been influenced by this experience.

Insights:

1. What are your observations about the organizations and professional roles and norms?
2. How did the WE change your view of yourself and contribute to your professional development?

3. What knowledge and skills (new or enhanced) were developed?
4. How did the WE affect your academic or career plans?
5. How did you think, feel and act in a professional setting and how did others in that setting think, feel and act toward you? What insights did you gain into your attitudes, values and behaviours?
6. Reflect on your approach to problem resolution in organizations.
7. How could you have benefitted more from the WE program?
8. Discuss whether you would recommend this organization to continue in the WE program.

Outcomes:

1. Describe your WE achievements.
2. Give examples of these accomplishments and the consequences of your work.
3. Describe the personal qualities, professional and technical skills you have developed through the program.

PERSONAL JOURNAL

The journal will be a reflection of your work experience and should bridge practical and theoretical knowledge. Journal will include the following information:

1. Personal observation.
2. Speculations, questions and predictions.
3. Evidence of developing self-awareness.
4. Connections between personal experience and new information – what new knowledge has been gained?

Journals must be submitted to the WE Coordinator or designated faculty supervisor on the end of the first three (3) weeks and the end of the sixth (6^{th}) week or the stipulated dates and times of their respective college. Each submission must be a maximum of two (2) pages doubled space.

GENERAL INFORMATION

1. **Attendance** – it is expected that the learner will not be absent **EXCEPT** for extreme extenuating circumstances. If you are absent from work, this must be communicated to your employer/designated work supervisor in advance. A doctor's certificate (in the case of illness) must be presented to the employer/designated work supervisor and a copy attached to your Work Log form.

2. **Dress** – should be appropriate to the work situation or in accordance with the Dress Code of the respective organization. It is the student responsibility to conform to the stipulated dress code of their employer.

3. **Company Regulations** – follow all company regulations. Learners must observe in particular the health and safety requirements of the organization; if an injury does occur on the job, contact your supervisors immediately.

4. **Confidentiality** – all business information must be dealt with in a confidential manner. Learner must not share business information with internal or external parties.

5. **Responsibility and Attitude** – the student is expected to act responsible and your attitude should reflect the utmost level of professionalism and ethics required at the workplace. It is your responsibility to ask for clarification of any hazy areas of assignments and have instructions on how to use the materials or tools required for the job. Learn as much as you can about company policy and operations and ask questions where appropriate. Your attitude reflects on the College you are representing so please conduct yourself accordingly and work to the best of your ability. If there are any problems or concerns at the work site please notify the WE Coordinator or designated faculty supervisor as soon as possible. Be proactive in solving any problems. May you be a credit to the success, great tradition and reputation that the program has built up over the many years in the community and business places in Jamaica.

   Failure to follow, act with integrity and honor your responsibilities could result in a "Failed/Incomplete Work Experience" decision for the relevant semester, a delay in graduation, or other disciplinary actions by the respective institution.

6. **Working Tips:**

   a. **Respect your supervisors** and listen to their suggestions. Giving respect will ensure you get it back.
   b. Demonstrate a **positive attitude** towards your work.
   c. **Be punctual.**
   d. **Take initiative** and ask for work when you are not busy.
   e. **Complete your tasks** in an organized way.
   f. **Be confident** (by exhibiting good communication skills, asking questions, giving feedback), professional (respect your work and show positive attitude towards it) and reliable (exhibit performance that shows you can be trusted and counted on).
   g. **Be a team player.**
   h. If you are not given enough work; speak with your direct supervisor.
   i. If you have a problem at work; speak first with your employer; if it is not solved, then contact the WE Coordinator. Don't just drop work or be absent.
   j. **Mobile phones should be placed on silent; and calls should be short and limited to important calls only.** One of the issues that are frequently brought forward by employers as causing problems and wasting time are mobile phone calls made or received by learners during work.

7. **Career Exploration** – the learner is encouraged to explore and discover as much information as possible about the career areas they are placed in and others that they are interested in.

8. **Exemptions –** the following applies to students requesting exemption from work experience:

A. Any student who is currently working in their field of study, can quality for exemption. However, the student must apply to the college for the exemption on the prescribed form.

The following applies to learners requesting exemption from work experience:

a. A learner must be working in his or her field of study for a minimum of six (6*)* months, for example a Bursar completing the Bachelor of Science Degree in Accounting.

b. The learner will submit the following documents to the WE Coordinator:
   i. A letter from his/her current employer confirming their employment and position.
   ii. Job Description.
   iii. Resume and Cover/Application Letter.
   iv. An essay of his or her core job functions and experiences gained (maximum of three (3) typed pages.

c. *Do* a presentation/exhibition on the organization and how his or her work helps it to achieve its strategic objectives. This presentation is for a maximum of fifteen (15) minutes to the WE Coordinator or designated faculty supervisor.

NB.

1. The respective college will provide the necessary documents for WE to its learners.
2. Learners who are granted exemption will **NOT** receive a letter grade on their transcript for WE. **The transcript will reflect their exemption status**.

B. The following will apply to **Part-time learners** are **who are currently working, but in a field not related to his or her course of study.**

a. The learners will be required to complete **80 hours** of work experience in an area related to his or her field of study.

b. The learner will also be evaluated based on completion of the following:

   i. Work experience attendance.

ii. Work experience report.
iii. Resume and Cover/Application Letter.
iv. Personal Journal.

C. The following will apply to **Part-Time Learners who ARE NOT working**.

a. The learner will be required to complete **all 240 hours** of work experience and complete each evaluation requirement as outlined in the course description.

NORMAL EVALUATION

The learner's evaluation will be based on forty (40%) percent of the employer's evaluation and sixty (60%) percent on the WE Coordinator or designated faculty supervisor's evaluation as follow:

	Percentage (%)	Evidence Generation
Work Experience Attendance	10%	1. Attendance Register 2. Complete 240 hrs
Work Experience Report	45%	1. typed WE Report 2. date submitted 3. all attached documents 4. APA Format
Resume & Cover/Application Letter	15%	1. typed Resume 2. typed Cover Letter 3. date submitted
Daily Work Log/Time Sheet	10%	1. typed weekly Work Log 2. date submitted
Personal Journal	15%	1. typed Journals (2) 2. date submitted 3. APA Format
Employer – Thank you Letter	5%	1. typed letter 2. date submitted
Total	**100%**	

EVALUATION – Part-Time Working Learners ONLY

	Percentage (%)	Evidence Generation
Work Experience Attendance	10%	1. Attendance Register 2. Complete 240 hrs
Work Experience Report	45%	1. typed WE Report 2. date submitted 3. all attached documents 4. APA Format
Resume & Cover/Application Letter	20%	1. typed Resume 2. typed Cover Letter 3. date submitted
Personal Journal	25%	1. typed Journals (2) 2. date submitted 3. APA Format
Total	**100%**	

ADDENDUM

The Council of Community Colleges of Jamaica

In keeping with the National Qualification Framework of Jamaica (2015), please ensure to instill in students that they must act ethically and professionally in decision making in their field.

2021 September 29