



**Dual Credit
Course Descriptions
2022-2023**

The following RIT/NTID courses will be available for dual credit during the 2022-2023 school year:

Liberal Studies:

1. UWRT-100 Critical Reading and Writing

Business Studies:

2. NACC-130 Personal Finance
3. NAST-160 Fundamentals of Spreadsheet Applications
4. NBUS-200 Orientation to Business

Computing Studies:

5. NACT-120 Introduction to Computer Applications
6. NACT-150 Introduction to PC Hardware
7. NACA-172 Website Development
8. NACT-230 Introduction to Programming

Graphic Technology:

9. NGRD-115 Visual Idea Development
10. NAIS-150 Page Layout I
11. NAIS-130 Raster and Vector Graphics

Engineering Studies:

12. NPMT-101 Blueprint Reading I
13. NCAD-150 Engineering Graphics
14. NPMT-214 CAD Applications

Mathematics:

15. NMTH-140 Mathematics in Society

Science:

16. NSCI-153 Processes of Science: Environmental Studies
17. NSCI-155 Processes of Science: Biological Studies
18. NSCI-156 Processes of Science: Forensics

Full course descriptions can be found on the following pages

RIT

National Technical Institute for the Deaf
Department of Liberal Studies

UWRT-100 Critical Reading and Writing

Course Description:

Critical Reading and Writing is a one semester, three-credit course limited to 15 students per section. This course is designed to help students develop the literacy practices they will need to be successful in their First-Year Writing course. Students will read, understand, interpret, and synthesize a variety of texts. Assignments are designed to challenge students intellectually, culturally and rhetorically. Through inquiry-based assignment sequences, students will improve their writing by developing academic research and literacy practices that will be further strengthened in First-Year Writing. Particular attention will be given to critical reading, academic writing conventions, and revision. Small class size promotes frequent student-instructor and student-student interaction. The course also emphasizes the principles of intellectual property and academic honesty in academic writing. **Credits: 3**

Goals:

- Students develop the academic literacy practices (including critical reading, academic writing, and research) required for successful engagement with and completion of the research and writing tasks assigned in First-Year Writing.
- Students develop critical reading practices to recognize and respond to purpose, audience, and stance.
- Students use digital and print resources for research, to begin to recognize the differences as well as the connections among facts, opinions, and values presented in a variety of sources.
- Students synthesize information from a variety of readings, selecting evidence to incorporate into writing assignments, and organize and manage source information.
- Students compose, revise, and edit written assignments following conventions of organizing, developing and supporting a claim based on course readings.
- Students understand the principles of intellectual property and academic honesty for academic writing and learn to use citation formats.

Topics:

- Critical reading and thinking (e.g., summarizing, paraphrasing, incorporating, responding, and reflecting);
- Information literacy (i.e., finding, evaluating, and integrating information from print and digital resources);
- Writing processes (i.e., prewriting, drafting, revising, editing, and using feedback from peers and instructor); and
- Clear expression of ideas (e.g., writing coherent sentences and paragraphs, revising for style and clarity).

Learning Outcomes:

Outcome: <i>At the completion of this course, students will be able to:</i>	Assessment Method
1. Students will demonstrate the ability to recognize and respond to purpose, audience, and stance.	<p>The instructor will assign and assess classroom and written discussion of at least 5 complex readings that include inference, evidence, and claims.</p> <p>The instructor will assign low stakes writing weekly to assess student progress in selecting a focus, and organizing and managing information.</p>
2. Students will demonstrate the ability to synthesize information from a variety of readings, selecting evidence to incorporate information into writing assignments.	<p>The instructor will assign and assess classroom and written discussion of at least 5 complex readings that include inference, evidence, and claims.</p> <p>The instructor will assign low stakes writing weekly to assess student progress in selecting a focus, and organizing and managing information.</p>
3. Students will demonstrate that they can use digital and print resources for research, beginning to recognize the differences as well as the connections among facts, opinions, and values presented in a variety of sources.	<p>The instructor will assign low stakes writing weekly to assess student progress in selecting a focus, and organizing and managing information.</p>
4. Students will demonstrate the ability to synthesize information from a variety of readings, selecting evidence to incorporate into writing assignments, and organize and manage source information.	<p>The instructor will assign low stakes writing weekly to assess student progress in selecting a focus, and organizing and managing information.</p>
5. Students will demonstrate their understanding that writing is a process that involves composing, revising and editing.	<p>The instructor will assess student success in achieving writing outcomes by means of scaffolded assignments that include multiple drafts of 3 major written assignments.</p>

<p>6. Students will demonstrate the principles of intellectual property and academic honesty for academic writing and learn to use citation formats.</p>	<p>The instructor will assess student success in achieving writing outcomes by means of scaffolded assignments that include multiple drafts of 3 major written assignments.</p>
	<p>Additionally, all students will meet individually with the instructor for progress conferences at least twice during the semester to talk about their reading and writing.</p>

Other Required Materials:

- *They Say, I Say with Readings* by Gerald Graff, Cathy Birkenstein and Russel Durst, 4th edition
- *Everyone's an Author* by Andrea Lunsford, et al, W.W. Norton, with readings (or a proposed text discussed with the Director of First Year Writing and the UWRT 100 teaching group collective)
- *The Norton Field Guide to Writing* by Richard Bullock and Maureen Daly Goggin
- A combination Writing and Rhetoric Textbook, with readings and handbook material. (e.g., *Everyone's an Author* by Lunsford, Andrea et al.)
- Other resources, such as academic databases, readings, technology support needs, etc.

RIT

National Technical Institute for the Deaf
Business Studies Department

NACC-130 Personal Finance

Course Description:

This course provides students with information and resources needed to understand the creation and implementation of a budget, use of credit and borrowing money responsibly, financial rights and ways to safeguard their money, and factors used to determine their readiness to buy a home or make other major purchases. Information on financial institutions such as banks, credit unions, and savings and loan organizations will also be covered. This course will provide students with basic financial literacy so they can develop sound financial management of their personal income as well as an understanding of the economic events that can influence their financial well-being and society as a whole. **Credits: 3**

Goals:

- To develop technical reading and writing skills as well as problem solving, critical thinking and decision-making skills related to understanding various financial aspects of everyday life
- To develop short-term and long-term financial goals required for a personal budget plan.
- To develop an understanding of banking services and credit usage
- To develop an appreciation of sound personal financial management
- To develop an understanding of various decision-making processes that applies to the roles of citizens, workers, and consumers

Topics:

- Personal Decision Making
- Paychecks
- Earning and Reporting Income
- Banking and Financial Institutions
- Saving and Investing
- Higher Education: Investment and Expenditures
- Managing Finances and Budgeting
- Buying Goods and Services
- Protection Against Risk
- Using Credit
- Retirement Planning
- Estate Planning

Learning Outcomes:

Outcome: <i>At the completion of this course, students will be able to:</i>	Assessment Method
1. To develop technical reading and writing skills as well as problem solving, critical thinking and decision-making skills related to understanding various financial aspects of everyday life <ul style="list-style-type: none"> • Analyze all aspects of a typical paycheck, including but not limited to voluntary and involuntary deductions/taxes • Develop and evaluate a budgeting/spending/savings plan and identify needs and wants • Identify various forms of income and analyze tax strategies and factors that affect income 	Instructor Observation, Homework Assignments, Exams, and In-Class Activities
2. To develop short-term and long-term financial goals required for a personal budget plan <ul style="list-style-type: none"> • Develop personal financial goals and personal financial statements • Analyze differences between buying house versus renting an apartment and buying an automobile versus leasing an automobile 	Instructor Observation, Homework Assignments, Exams, and In-Class Activities
2. To develop an understanding of banking services and credit usage <ul style="list-style-type: none"> • Evaluate services provided by financial deposit institutions • Analyze factors that affect the choice of credit, the cost of credit, and the legal aspects of using credit 	Homework Assignments and In-Class Activities
3. To develop an appreciation of sound personal financial management <ul style="list-style-type: none"> • Analyze choices available to consumers for protection against risk/financial loss • Evaluate differences between money markets, stocks, bonds, and mutual funds 	Instructor Observation, Homework Assignments, Quizzes, Exams, and In-Class Activities
4. To develop an understanding of various decision-making processes that applies to the roles of citizens, workers, and consumers <ul style="list-style-type: none"> • Explore insurance options available for protection insuring one's health, vehicle, life, liability, property, disability, and long-term care • Analyze the differences between wills, living wills, power of attorney and trusts • Analyze differences between 401(k), 403(b), 457(b) IRA and Roth IRA retirement plans 	Assignments, Quizzes, Exams, and In-Class Activities

Other Required Materials:

- Computer Lab with connections to online services and media projection equipment
- Microsoft Office software (i.e., *microsoft.com/money*)
- Intuit software (i.e., *Quicken* and *TurboTax*)
- World Wide Web/Internet personal finance sites (i.e., *money.cnn.com*, *kiplinger.com*, *mymoney.gov*, and *mint.com*)

RIT

National Technical Institute for the Deaf
Business Studies Department

NAST-160 Fundamentals of Spreadsheet Applications

Course Description:

Emphasis will be on creating, formatting, and enhancing worksheets; creating and applying formulas and functions; building and formatting charts; using What-If analysis and creating templates. Upon completion, students will be able to design and enhance basic spreadsheets.

Credits: 3

Goals:

- To develop a strong foundation in the fundamental concepts and terminology used in the design and development of data in a spreadsheet
- To provide an understanding of how spreadsheet applications incorporate communication skills, information management skills and the ability to work without direction as required on the job
- To develop the technical reading and writing as well as critical thinking decision-making and problem-solving skills needed to analyze and manipulate data in a spreadsheet
- To develop appropriate work skills by modeling appropriate business behaviors and attitudes in the classroom

Topics:

- Organizing and analyzing data
- Creating a worksheet
- Formatting data and content
- Managing data and workbooks
- Creating and applying formulas and functions
- Creating and formatting charts
- Applying What-If analysis
- Collaborating
- Creating templates and customizing spreadsheets

Learning Outcomes:

Outcome: <i>At the completion of this course, students will be able to:</i>	Assessment Method
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<p>4.1 Develop a strong foundation in the fundamental concepts and terminology used in the design and development of data in a spreadsheet. (Goal 3.1)</p> <p>4.1.1 Defines technical terminology</p> <p>4.1.2 Designs and develops spreadsheets by organizing, analyzing and creating data in a worksheet; formatting data and content while managing data and workbooks; creating and formatting charts in a professional manner; creating templates and customizing worksheets</p>	<p>Assignments, Exams</p>
<p>4.2 To provide an understanding of how spreadsheet applications incorporate communication skills, information management skills and the ability to work without direction as required on the job</p> <p>4.2.1 Demonstrates effective written communication through collaborative work</p> <p>4.2.2 Demonstrates information management skills related to maintaining integrity of the spreadsheet</p> <p>4.2.3 Demonstrates ability to work without direction</p>	<p>Assignments, Exams</p>
<p>4.3 To develop the technical reading and writing as well as critical thinking decision-making and problem-solving skills needed to analyze and manipulate data in a spreadsheet</p> <p>4.3.1 Applies critical thinking and problem-solving skills to Determine relevant and correct information in a worksheet by creating and applying appropriate formulas; creating and applying appropriate functions; applying What-If Analysis</p> <p>4.3.2 Applies technical reading comprehension to written questions about spreadsheets and its function in business</p>	<p>Assignments, Exams</p>
<p>4.4 Continue to develop appropriate work skills by modeling appropriate business behaviors and attitudes in the classroom</p> <p>4.4.1 Model appropriate self-management while in the classroom by:</p> <p>4.4.1.1 Demonstrating promptness</p> <p>4.4.1.2 Utilizing all appropriate course materials</p> <p>4.4.1.3 Meeting established deadlines</p> <p>4.4.1.4 Managing stressful situations effectively while interacting with peers and faculty</p>	<p>Mid-term/final exams, work skills evaluation form</p>

Other Required Materials:

- Technology requirements:
 - Regular and frequent access to a computer that is 0 - 5 years old, with at least 1GB of RAM
 - Reliable high-speed internet access (broadband, cable, or fiber)
 - An up-to-date web browser (Safari, Chrome, Internet Explorer, or Firefox)
 - Microsoft Windows (Vista, 7 or later) or Mac OS X
 - Able to print documents
 - Able to record yourself and upload video posts/assignments
 - Additional requirements as noted in course syllabus or as specified by instructor
- Access to a cloud/google drive
- Computer Lab with connections to online services and media projection equipment
- Microsoft 365
- Webcam with MP4 video capability

RIT

National Technical Institute for the Deaf
Business Studies Department

NBUS-200 Orientation to Business

Course Description:

This course introduces students to a broad overview of the form and structure of multinational organizations. It provides students with a basic knowledge of the history, organization and operation of business and its particular vocabulary. **Credits: 3**

Goals:

- Develop technical reading, writing, problem solving, critical thinking, and decision-making skills related to basic business concepts. To develop short-term and long-term financial goals required for a personal budget plan
- Acquire knowledge of business ethics and social responsibility and examine their importance
- Acquire knowledge of global business climate, cross-cultural and international business and management practices
- Develop interpersonal and effective communication skills through appropriate interactions with peers, faculty, and guest speakers

Topics:

- The Dynamics of Business and Economics
- Business Ethics and Social Responsibility
- Business in a Borderless World
- Managing Information Technology and E-Business
- Options for Organizing Business
- Small Business, Entrepreneurship, and Franchising
- The Nature of Management
- Organization, Teamwork, and Communication
- Managing Service and Manufacturing Operations
- Motivating the Workforce
- Managing Human Resources
- Customer-Driven Marketing
- Dimensions of Marketing Strategy
- Accounting and Financial Statements
 - The Nature of Accounting
 - The Accounting Process
 - Financial Statements
- Money and the Financial System
 - Money in the Financial System

Learning Outcomes:

Outcome: <i>At the completion of this course, students will be able to:</i>	Assessment Method
7.1 Develop technical reading, writing, problem solving, critical thinking, and decision making skills related to basic business concepts (Goal 3.1) 7.1.1 Define technical vocabulary 7.1.2 Describe business concepts and applications using appropriate vocabulary	Class assignments, quizzes, examinations Team presentations, class assignments, quizzes, class activities and examinations
7.2 Acquire knowledge of business ethics and social responsibility and examine their importance. (Goal 3.2) 7.2.1 Draw conclusions on ethical dilemmas 7.2.2 Identify ways that organizations can act responsible to society	Class activities, class assignments, projects Class assignments, quizzes, class activities and examinations
7.3. Acquire knowledge of global business climate, cross-cultural and international business and management practices. (Goal 3.3)	
7.3.1 Identify the major barriers that confront global businesses.	Team presentations, class assignments, quizzes, class activities and examinations
7.3.2 Identify the types of trade restrictions	Class assignments, quizzes, examinations
7.3.3 Distinguish the different levels of involvement used by businesses when entering global markets	Class assignments, quizzes, examinations
7.4. Develop interpersonal and effective communication skills through appropriate interactions with peers, faculty, and guest speakers. (Goal 3.4)	
7.4.1 Conduct presentations on business concepts	Team/individual presentations
7.4.2 Articulate business concepts and ideas related to class interactions and discussions.	Class activities and participation

Other Required Materials:

- Technology requirements:
 - Regular and frequent access to a computer that is 0 - 5 years old, with at least 1GB of RAM
 - Reliable high-speed internet access (broadband, cable, or fiber)
 - An up-to-date web browser (Safari, Chrome, Internet Explorer, or Firefox)
 - Microsoft Windows (Vista, 7 or later) or Mac OS X
 - Able to print documents
 - Able to record yourself and upload video posts/assignments
 - Additional requirements as noted in course syllabus or as specified by instructor

- Access to a cloud/google drive
- Computer Lab with connections to online services and media projection equipment
- Microsoft 365
- Webcam with MP4 video capability



National Technical Institute for the Deaf
Information and Computing Studies Department

NACT-120 Introduction to Computer Applications

Course Description:

This course is an introduction to using general-purpose software tools. The tools to be covered include word processing, spreadsheet, database, and presentation software as well as an email client. Students will do hands-on work in each application. **Credits: 3**

Goals:

- To master the basic features of an integrated software package or suite that includes email, word processing, spreadsheet, database, and presentation software
- To learn how to select the right application for a task
- To learn how to combine the features of several applications in order to perform a task
- To develop the computer terminology and technical reading and writing skills to effectively use office applications

Topics:

- The Computer Operating System
 - Exploring the basics
 - Working with files
- Word Processing
 - Creating a document
 - Editing and formatting a document
 - Creating a multiple-page report
 - Publishing a newsletter
- Spreadsheet Software
 - Using spreadsheet software to manage financial data
 - Working with formulas and functions
 - Developing a professional-looking worksheet
 - Working with charts and graphics
- Database Software
 - Introduction to database concepts
 - Creating tables and populating data
 - Querying a database
 - Creating forms and reports
 - Maintaining a database
- Presentation Software
 - Creating a presentation
 - Applying and modifying text and graphic objects
- Email Applications
 - Email and information management
- Integrating Productivity Suite Applications

Learning Outcomes:

Outcome: <i>At the completion of this course, students will be able to:</i>	Assessment Method
1. Use a word processor to develop documents using specified text formatting, column formatting, graphics, header/footers and data fields such as current dates and page numbers	Assignment and exams
2. Use spreadsheet software to format text, automate calculations using functions and formulas, create charts based on selected data, and use advanced features such as themes and conditional formatting	Assignments and exams
3. Create and maintain simple databases including creating tables and generating simple queries, forms and reports	Assignments and exams
4. Design multimedia presentation material using sample slide layouts and color themes. Print the presentation material as slides, notes or handouts	Assignments and exams
5. Utilize features in the email system beyond the simple read, send and delete capabilities such as searching, filtering, and assigning email to folders and using the calendar functions	Assignments and exams
6. Identify the type of documentation needed and the appropriate software to accomplish a task	Assignments and exams
7. Use features from different applications within a productivity suite to create an integrated document such as a presentation utilizing data from a database, a chart from a spreadsheet software, and text from a word processing application	Assignments and exams
8. Identify and describe in writing the computer terminology used in common productivity suites	Assignments and exams
9. Use provided or student-selected texts and online multimedia to read and further develop skills to enhance documentation	Assignments and exams
10. Write well-formed documentation and utilize available proofreading features	Assignments and exams

Other Required Materials:

- Microsoft Office Suite (most recent version) is required for this course

RIT

National Technical Institute for the Deaf
Information and Computing Studies Department

NACT-150 Introduction to PC Hardware

Course Description:

This course introduces the fundamental hardware concepts of Windows-based computers. The skills required to install, upgrade and maintain computers are presented. The course provides students with methodologies and hands-on activities related to the configuration, diagnosis, repair, upgrade, and preventive maintenance of computer hardware, input/output devices and data communications. Topics include the basic functions and use of test equipment, logical troubleshooting of internal system conflicts and faulty peripherals, and electrical safety.

Credits: 3

Goals:

- To learn how the CPU has developed and the future direction of CPU development
- To understand the functions and settings of all the components in a Windows-based PC and how they interact
- To develop the skills to be able to assemble a PC from individual components
- To learn how to install and configure a Windows operating system
- To develop the skills to be able to perform common PC upgrades
- To develop the critical thinking, logic, and technical skills needed to troubleshoot and repair PCs
- To learn how to obtain technical information on hardware and/or configurations via on-line and digital resources
- To develop the skills to be able to set up and troubleshoot peripherals
- To learn computer-related preventive maintenance, safety, and environmental issues
- To develop the reading skills needed to understand technical materials such as college textbooks, professional journals, and manuals provided by the computers manufacturer
- To develop the technical writing skills needed to document PC problems and how they were resolved

Topics:

- Hardware components
- Assemble a PC from components
- Binary and Hexadecimal Number Systems
- System Resources
 - IRQ
 - DMA Channels
 - I/O Address
 - Memory Address
- Boot up configuration
- Electricity and Power Supplies

- Preventive Maintenance & Care of PC
 - Protecting your computer against electricity static discharge
 - Electromagnetic interference
 - Surge Protection and UPS
- The System Board
 - Configure and upgrade a PC
- Supporting I/O devices
 - Installing and Configuring Peripheral Devices
 - Using Various Ports and Expansion Slots
- Installing Storage Devices
- System Upgrading and Optimizing
 - Motherboard, boot up system and memory
 - CPU, processor speed, and compatibility
 - Power supply output capacity
 - Bus types and characteristics
- Notebooks, mobile devices
- Diagnosing and Troubleshooting
- Disposing and recycling of computer component and peripherals

Learning Outcomes

Outcome: <i>At the completion of this course, students will be able to:</i>	Assessment Method
<p>4.1. <i>To learn how the CPU has developed and future direction of CPU development.</i></p> <p>4.1.1. Describe the history of CPU development and future direction of CPU development.</p>	Assignments and exams
<p>4.2. <i>To understand the functions and settings of all the components in a Windows-based PC and how they interact</i></p> <p>4.2.1. Identify all the components in a computer</p> <p>4.2.2. Explain the function of each component in a computer</p> <p>4.2.3. Explain how each component interacts with the motherboard and/or other components</p> <p>4.2.4. Convert decimal numbers to binary and hexadecimal</p>	Lab activities, assignments, and exams
<p>4.3. <i>To develop the skills to be able to assemble a PC from individual components.</i></p> <p>4.3.1. Assemble a computer from individual components.</p>	Lab activities and exams
<p>4.4 <i>To learn how to install and configure a Windows operating system.</i></p> <p>4.4.1. Install and configure a Windows OS</p>	Lab activities and exams
<p>4.5. <i>To develop the skills to be able to perform common PC upgrades</i></p> <p>4.5.1. Upgrade memory</p> <p>4.5.2. Upgrade drivers</p> <p>4.5.3. Upgrade BIOS</p>	Lab activities and exams
<p>4.6. <i>To develop the critical thinking, logic, and technical skills</i></p>	Lab activities and exams

<p><i>needed to troubleshoot and repair PCs</i></p> <p>4.6.1. Troubleshoot computer hardware and OS issues</p> <p>4.6.2. Repair hardware and OS issues</p>	
<p><i>4.7. To learn how to obtain technical information on hardware and/or configurations via on-line and digital resources.</i></p> <p>4.7.1. Obtain technical information on hardware and/or configurations using the Web or other digital resources</p>	Lab activities, assignments, and exams
<p><i>4.8. To develop the skills to be able to set up and troubleshoot peripherals.</i></p> <p>4.8.1. Set up peripherals so they are in working order</p> <p>4.8.2. Use software and hardware tools to troubleshoot and/or repair peripherals</p>	Lab activities and exams
<p><i>4.9. To learn computer-related preventative maintenance, safety, and environmental issues</i></p> <p>4.9.1. Use safety precautions and avoid the dangers of static electricity</p> <p>4.9.2. Follow preventative maintenance procedures for computers</p> <p>4.9.3. Follow computer-related safety precautions</p> <p>4.9.4. Follow correct procedures for recycling and disposing of computer hardware and peripherals</p>	Lab activities and exams
<p><i>4.10. To develop the reading skills needed to understand technical journals such as college textbooks, professional journals, and manuals provided by the computer's manufacturer</i></p> <p>4.10.1. Read and use technical material as a reference for troubleshooting, repairing, maintaining, or upgrading a PC</p>	Lab activities, assignments, and exams
<p><i>4.11. To develop the technical writing skills needed to document PC problems and how they were resolved</i></p> <p>4.11.1. Create lab reports that document the troubleshooting procedures that were used to find problems with a PC and how the problems were resolved</p>	Lab activities and exams

RIT

National Technical Institute for the Deaf Information and Computing Studies Department

NACA-172 Website Development

Course Description:

This course introduces students to web page and small-scale website development. Through hands-on laboratory experiences, students will learn the fundamental concepts needed to construct web pages that follow appropriate coding standards as well as basic design principles to present content in an attractive and organized manner. Topics include HTML, CSS, graphical elements, website publishing, and transfer protocols. **Credits: 3**

Goals:

- To understand what the Internet is, how browsers display web pages, and the history of the Internet
- To develop the skills to create a basic website using valid HTML tags, CSS, graphics and links
- To understand design principles as they relate to web page design
- To understand how to search for, use, and manipulate a variety of digital resources, and the legal implications of their use
- To learn how to use both Windows and UNIX operating environments for file management and application tasks
- To develop the study skills and the independent learning skills needed to succeed in baccalaureate level courses
- To develop the writing skills needed to present text-based information on a web page in a clear, concise and organized manner
- To develop the reading skills needed to understand technical materials such as books, journals, and manuals related to web development

Topics:

- Introduction to the Internet
 - Internet browsers and interoperability
 - Internet addressing
 - History of the WWW and Internet
- HyperText Markup Language 5 (HTML 5)
- HTML tags and styles
 - Basic HTML Structure
 - Basic HTML Formatting
 - Images
 - Locating digital resources
 - Copyright and IP issues
 - Image creation and manipulation

- Links
- Tables
- Multimedia
- Cascading Style Sheets 3
 - Defining selectors
 - Formatting with Styles
 - Layout with Styles
- W3C Validation
- Search and metadata
- Accessibility
 - Alt and Title attributes
 - Web Content Accessibility Guidelines
- Internet Protocols
 - Hypertext Transfer Protocol
 - File Transfer Protocol (FTP)
 - Secure FTP
- Basic Web Page Design
 - Content Creation/Organization
 - User experience and usability
 - Navigation design
- UNIX Operating System
 - File and directory management
 - Access permissions

Learning Outcomes:

Outcome: <i>At the completion of this course, students will be able to:</i>	Assessment Method
1. Utilize basic Internet protocols and tools including FTP	Class exercises, Projects, Quizzes, & Tests
2. Identify key figures and events in the development of the Internet and the World Wide Web	Projects, Quizzes & Tests
3. Create web pages using valid HTML 5 and CSS 3 including graphics and links	Class exercises, Projects, Quizzes, & Tests
4. Use graphic tools to optimize images for web pages	Class exercises, Projects, Quizzes, & Tests
5. Upload pages to a web server	Class exercises, Projects, Quizzes, & Tests
6. Demonstrate knowledge of graphic and information design as well as web design principles to create valid web pages	Class exercises, Projects, Quizzes, & Tests
7. Demonstrate knowledge of digital imaging concepts such as file formats, resolution, color models, and compression methods	Class exercises, Projects, Quizzes, & Tests
8. Perform a search to gather information from the Internet	Class exercises & Projects
9. Demonstrate an understanding of the importance of copyright laws and citing digital sources	Projects
10. Perform basic file and directory management tasks in the UNIX environment such as creating, deleting, and renaming items, and changing access permissions	Class exercises, Projects, Quizzes, & Tests
11. Demonstrate the ability to create valid web pages without the use of external resources	Quizzes & Tests

12. Research and present content on a web page in a clear, concise, and organized manner	Class exercises & Projects
13. Demonstrate the ability to read web references to independently and correctly use new features of HTML	Class exercises, Projects, Quizzes, & Tests
14. Use CSS 3 to support responsive web pages	Class exercises, Projects, Quizzes, & Tests

Other required materials:

- Computers
 - Keyboard and mouse
 - Internet connection
 - Text editor (for instance: Freeware)
 - Image editor (for instance: Photoshop or Gimp)
- Server space

RIT

National Technical Institute for the Deaf Information and Computing Studies Department

NACT-230 Introduction to Programming

Course Description:

This course introduces students to the fundamental concepts and terminology of computer programming. Emphasis will be placed on developing problem-solving skills in designing and writing simple computer programs. The course covers such topics as developing flowcharts, algorithms and pseudocode, and introduces students to variables, operators, conditional statements, looping statements, data structures, error-handling and debugging, and user interface design. The course assumes no programming background. **Credits: 3**

Goals:

- To understand programming concepts and terminology
- To develop the critical thinking and problem-solving skills needed to write well structured, syntactically correct programs that solve general application problems
- To learn to appropriately use the components of a programming language, including variables and data types, relational and logical operators, branching, and looping, and data structures
- To develop the skills to read, trace, and understand simple code
- To develop the skills to write, test, and debug code to solve a simple problem
- To successfully use many features of a programming language compiler to create, debug, and execute programs
- To enhance students' reading and writing abilities

Topics:

- Introduction to Programming
 - Overview of Computer Programming Languages
- The Software Development Process
 - Software Development Life Cycle
 - Algorithms
 - Flowcharts
 - Pseudocode
- Variables, Data, Input, and Output
 - Variables
 - Data Types
 - Declarations
- Operators and Expressions
 - Arithmetic
 - Relational
 - Logical
 - Operator Precedence
- Decisions

- If Statements
- If-Else Statements
- Switch Statements
- Repetitions
 - For Loops
 - While Loops (Pretest Loops)
 - Do-While Loops (Posttest Loops)
- Arrays
 - Use arrays for storage and retrieval of data in a program
- Introduction to Developing a User Interface
 - How to design user interface for software applications
 - Best practices for user interface design
 - Building a user interface

Learning Outcomes:

Outcome: <i>At the completion of this course, students will be able to:</i>	Assessment Method
<i>7.1 To understand programming concepts and terminology</i>	
7.1.1 Understand what software development is and what software developers do	Assignments, Class Exercises, and Exams
7.1.2 Describe the purposes of programming and software development	Assignments, Class Exercises, and Exams
7.1.3 Define an integrated development environment	Assignments, Class Exercises, and Exams
<i>7.2 To develop the critical thinking and problem-solving skills needed to write well-structured, syntactically correct programs that solve general application problems</i>	
7.2.1 Describe the software development process, its purpose, critical steps, and where programming fits in that process	Assignments, Class Exercises, and Exams
7.2.2 Identify a problem that requires a programmed solution. (algorithms)	Assignments, Class Exercises, and Exams
7.2.3 Describe problem-solving techniques	Assignments, Class Exercises, and Exams
<i>7.3 To learn to appropriately use the components of a programming language, including variables and data types, relational and logical operators, branching, and looping, and data structures</i>	
7.3.1 Demonstrate the use of variables	Assignments, Practice Exercises, and Exams
7.3.2 Describe the various data types you can use to declare variables	Assignments, Practice Exercises, and Exams
7.3.3 Demonstrate the use of operators including arithmetic, relational, and logical operators	Assignments, Practice Exercises, and Exams
7.3.4 Demonstrate the use of If, If-Else, and Switch statements	Assignments, Practice Exercises, and Exams

7.3.5	Demonstrate the use of For, While (Pretest), and Do-While (Posttest) Loops	Assignments, Practice Exercises, and Exams
7.3.6	Identify and troubleshoot syntax, runtime and logic errors	Assignments, Practice Exercises, and Exams
7.3.7	Create and use arrays	Assignments, Practice Exercises, and Exams
7.4	<i>To develop the skills to read, trace, and understand simple code</i>	
7.4.1	Trace program logic to identify logic errors and/or program output	Assignments, Class Exercises, and Exams
7.5	<i>To develop the skills to write, test, and debug code to solve a simple problem</i>	
7.5.1	Write computer programs to solve problems using features such as input and output statements, conditional statements, looping statements, and arrays	Assignments, Practice Exercises, and Exams
7.5.2	Employ various techniques for testing and debugging computer programs to ensure accurate results	Assignments, Practice Exercises, and Exams
7.6	<i>To successfully use many features of a programming language compiler to create, debug, and execute programs</i>	
7.6.1	Define an integrated development environment	Assignments, Class Exercises, and Exams
7.6.2	Identify the features of a good user interface design for software applications	Assignments, Class Exercises, and Exams
7.6.3	Demonstrate proficiency in using the programming language in developing creative solutions to solving problems	Assignments, Class Exercises, and Exams
7.6.4	Illustrate how pseudocode and flowcharts are used in creating computer programs	Assignments, Class Exercises, and Exams
7.7	<i>To enhance students' reading and writing abilities</i>	
7.7.1	Write clear program documentation including the purpose of the program and comments on the function of program logic	Assignments and Class Exercises
7.7.2	Demonstrate an understanding of programming concepts and programming design through reading	Assignments and Class Exercises
7.7.3	Demonstrate an understanding of programming concepts and programming design in writing	Assignments and Class Exercises

Other required materials:

- Computers
 - Internet connection
 - Microsoft Visual Studio

RIT

National Technical Institute for the Deaf
Visual Communications Studies

NGRD-115 Visual Idea Development

Course Description:

This course gives students the opportunity to see themselves, their experiences and their environment as sources of creativity, through a variety of activities which will include classroom discussions; videos of artists; visiting a gallery; keeping documented written and illustrated journals, sketchbooks; and working with a team to do a project. Students learn strategies for developing concepts and organization of thought processes as well as systems to formulate solutions to design problems. The library is used for development of research skills for written and visual content. **Credits: 3**

Goals:

- Develop reading, writing, analytical thinking, and problem-solving skills related to visual idea development
- Develop the ability to see one's experience and environment as a source of creativity
- Familiarize the student with development and organization of thought processes and systems to formulate solutions to design problems and handle abstract concepts
- Develop team and individual approaches to problem-solving and critique

Topics:

- Mental Flexibility and Generating Ideas
- Communicating with Myself by Using a Journal Sketchbook
- The Design Process
- Finding Library Resources
- The Team Spirit
- Other Artists' Creativity
- Reference Files/Sources and Copyright Laws
- Brainstorming Strategies
- Team Project

Learning Outcomes:

Outcome: <i>At the completion of this course, students will be able to:</i>	Assessment Method
7.1 Use the library and other resource locations for development of research skills	Successful completion of projects; presentations; critique
7.2 Use design periodicals/annuals for reference	Presentations; critique

7.3 Use "swipe" (idea) files for reference	Presentations; critique
7.4 Define copyright laws and their relation to the use of graphic images for design problem-solving	Presentations; critique
7.5 Work successfully as part of a team to solve design problems	Successful completion of projects; presentations; critique
7.6 Use a self-documented journal as a means of recording ideas for future design problem-solving	Successful completion of projects; presentations; critique
7.7 Use a sketchbook as a means of recording ideas for future design-problem solving. Identify design problem-solving methods used by professional designers	Successful completion of projects; presentations; critique
7.8 Identify design problem-solving methods used by professional designers	Successful completion of projects; presentations; critique
7.9 Develop personal design problem-solving strategies that are drawn from the student's own personal experiences and environmental influences	Successful completion of projects; presentations; critique
7.10 Use basic vocabulary related to design problem-solving	Critique
7.11 Use team and individual approaches to critique	Successful completion of projects; presentations; critique

Other required materials:

- Computers with word processing software
- Black marker (broad and fine nibs such as Sharpie)
- Black pen (uni-ball micro)
- Prismacolor colored markers (12 colors)
- Travel watercolor box (Sakura Koi Watercolor Field Sketch Box, 18 Color Set)
- White-out pens
- 12" ruler
- HB pencil
- Eraser
- Sharpener
- Sketchbook (5 x 8") OR (9 x 12") (Strathmore Visual Journal Drawing)
- Scanner (to scan and upload all sketches) and/or digital camera
- Other art materials for the team project in addition to \$10 cash per team member for the art materials for the team project

RIT

National Technical Institute for the Deaf
Visual Communications Studies

NAIS-150 Page Layout I

Course Description:

Students will use page layout (desktop publishing) applications to design and produce pages and documents to given specifications. Skill development will include importing and placing text and graphic files, the application of style sheets, templates, snippets, libraries, and color specifications. The application of design and typographic principles, industry terminology, measurement systems, font management, and file management are also covered. **Credits: 3**

Goals:

- Develop reading, writing, analytical thinking, and problem solving related to desktop publishing
- Improve technical skills in using software applications to manipulate and efficiently utilize the elements of a document, including typography, design, graphics and layout
- Prepare for a job application and interview, including resume writing and portfolio building processes

Topics:

- Job Specifications
 - Measurement
 - Fonts
- Graphics
 - Bitmapped vs. vector files and formats
 - Element creation (rules, tints, etc.)
 - Image manipulation
- Electronic Page Layout
 - File setup
 - File naming and identification
 - Document layout
 - Pagination
 - Master pages
 - Templates
 - Libraries
 - Tables
- Placing text
 - Text flow
 - Style sheets
- Placing graphics
 - Graphic manipulation
 - Linking
- Integrating text and graphics

- Color: Color systems and techniques
- File saving
- Use of Help menu, on-line help, and documentation
- Document Output
- File Management
- Design Fundamentals
 - Design principles: balance, emphasis, rhythm, unity, figure/ground
 - Design elements: line, shape, value, color, texture, type
 - Formats and grids

Learning Outcomes:

Outcome: <i>At the completion of this course, students will be able to:</i>	Assessment Method
1. Analyze project specifications and determine most appropriate page layout strategies for document construction	Projects & Performance Tests
2. Define application preferences and workspace arrangement to best fit document requirements and personal work style	Projects & Performance Tests
3. Design and produce well-crafted and visually appealing layouts integrating typography and graphic effects	Projects & Performance Tests
4. Accurately use and apply correct technical vocabulary related to desktop publishing procedures and software applications	Written & Performance Tests
5. Identify the purpose of, and demonstrate proficiency with, the graphic and drawing tools in desktop publishing applications	Written & Performance Tests
6. Define document colors, styles, and master elements for efficient productivity in desktop publishing procedures	Projects & Performance Tests
7. Apply industry-standard procedures for document preparation for final print output requirements and archiving	Projects & Performance Tests
8. Describe primary skills learned in this course; select and archive projects which may be appropriate for inclusion in a portfolio	Written & Performance Tests

Other required materials:

- Adobe InDesign (most recent version) and ability to produce printed output are required for this course

RIT

National Technical Institute for the Deaf
Visual Communications Studies

NAIS-130 Raster and Vector Graphics

Course Description:

This course introduces students to the skills needed for the successful production and manipulation of raster and vector images using image creation and production software. Students will work in bitmap and vector applications, producing and editing with the tools and techniques offered by the software programs such as selection techniques, basic layer controls, digital masking, image correction and enhancement. Additional topics will include the relevance of image size, resolution and file format specifications when working with raster and vector images. Comprehension and correct usage of terminology and concepts are emphasized. **Credits: 3**

Goals:

- Develop reading, writing, analytical thinking, and problem solving skills related to bitmap and vector images and basic digital image manipulation
- Learn how to use raster and vector programs to create and manipulate images
- Foster ability to make fundamental image manipulation decisions
- Understand how to design and evaluate digital images
- Enhance knowledge needed for saving and managing graphic files in various file formats for screen, digital printer, or press output
- Understand how to compress, store and retrieve digital images
- Learn to make appropriate decisions regarding file formats and file management
- Prepare for the job application and interview, resume writing, and portfolio building processes

Topics:

- Definition, purpose, benefits, differences, between bitmap and vector graphics
- Basic tools, menus and controls needed for bitmap and image creation and editing
- Working with selections
- Layers in bitmap graphics
- Correcting and enhancing digital photos
- Masks and channels
- Type
- Vector tools in a bitmap application
- Selecting and aligning tools
- Creating shapes combining and editing
- Transforming objects
- Drawing with vector tools
- Color
- Working with type
- Working with Layers in vector graphics

- Working with perspective drawing
- Blending and adjusting color and shapes
- Working with Brushes
- Applying and editing effects
- Appearance attributes and graphic styles
- Vector graphics and other applications

Learning Outcomes:

Outcome: <i>At the completion of this course, students will be able to:</i>	Assessment Method
1. Compare and use raster and vector software applications as appropriate for design and job specifications	Successful completion of projects per specified criteria; Tests & Exams
2. Identify and describe characteristics of raster and vector images	Successful completion of projects per specified criteria; Tests & Exams
3. Use Adobe Photoshop to create, save, and edit raster images	Successful completion of projects per specified criteria; Tests & Exams
4. Use Adobe Illustrator to create, save, and edit vector images	Successful completion of projects per specified criteria; Tests & Exams
5. Explain and discuss issues of ethics, copyright, and professional responsibilities in the selection, use, and/or modification of graphic images	Critiques, class discussions & Tests & Exams
6. Identify and demonstrate the use of correct file formats for Web and print	Successful completion of projects per specified criteria; Tests & Exams
7. Describe primary skills learned in this course; select and archive projects which may be appropriate for inclusion in a portfolio	Successful completion of projects per specified criteria; Tests & Exams

Other Required Materials:

- Adobe Photoshop and Illustrator (most recent versions) are required for this course

RIT

National Technical Institute for the Deaf
Engineering Studies

NPMT-101 Blueprint Reading I

Course Description:

Students develop the basic skills necessary to read and interpret fundamental engineering drawings of details, subassemblies and assemblies. **Credits: 3**

Goals:

- Develop the skills necessary to read, analyze and interpret standard engineering drawings
- Learn to apply these skills in problem-solving situations
- Develop the skills necessary to communicate technical information with co-workers
- Develop the ability to apply math and engineering graphics skills to solve technical graphic problems
- Develop the ability to use basic shop math to perform all the calculations necessary to interpret basic engineering drawings

Topics:

- Common fractions, decimal fractions and percentage
- Engineering drawing nomenclature and symbols
- Dimensioning Systems
- Single-view and detail drawings
- Sketching views from objects and isometric drawings
- Tolerances
- Arcs and circles
- Projections
- Multi-view drawings
- Angles and angular dimensions
- Machined features
- Surface roughness
- Sectional Views
- Threaded hole specifications
- Metric Drawings
- Introduction to Geometric Dimensioning & Tolerancing

Learning Outcomes:

Outcome: <i>At the completion of this course, students will be able to:</i>	Assessment Method
1. Describe the meaning of every line in each view and identify all symbols	Exams, Homework & Classwork
2. Describe the shape and location of each feature of an object in all views of a machine drawing	Exams, Homework & Classwork
3. Identify, using correct vocabulary, the tools, and materials and machining processes as stated on a blueprint	Exams, Homework & Classwork
4. Perform all calculations required in the interpretation of a blueprint to produce a finished machine part	Exams, Homework & Classwork
5. Demonstrate appropriate work habits and willingness to cooperate with co-workers	Observation
6. Verify that given prints conform to established industrial tolerance standards	Exams, Homework & Classwork

RIT

National Technical Institute for the Deaf
Engineering Studies

NCAD-150 Engineering Graphics

Course Description:

The objective of this course is to introduce students to engineering graphics as a means of communication in the technical fields of architecture, engineering and construction (A/E/C). The course is laboratory oriented and provides the student with basic skills to create professional 2D drawings with this comprehensive first course in the use of AutoCAD software for mechanical, architectural and civil drawings. The course assumes no prior knowledge of engineering drawing or CAD. **Credits: 3**

Goals:

- Develop reading, writing and critical thinking skills related to engineering graphics
- Understand proper computer usage and lab safety procedures
- Learn file management techniques and understand various file formats for CAD programs
- Know how to set up CAD drawing parameters for different disciplines including mechanical, architecture and civil
- Develop basic CAD skills to create, modify and manipulate 2D technical drawings
- Understand different procedures for printing and plotting CAD drawings
- Develop basic skills in free hand lettering and technical sketching

Topics:

- Introduction to Computer Aided Drafting
- Introduction to the AutoCAD interface
- Navigating the AutoCAD environment
- Understanding drawing in 'real world' scale and the Cartesian coordinate system
- Basic 2D object construction tools
- 2D geometric construction and editing tools
- Object properties and organization
- Basic dimensioning and notes
- Templates, layouts and plotting
- Freehand lettering and technical sketching

Learning Outcomes:

Outcome: <i>At the completion of this course, students will be able to:</i>	Assessment Method
1. Understand the role of Computer Aided Drafting (CAD) in the engineering and construction fields	Exams & Homework
2. Demonstrate proper file management strategies	Lab Exercises
3. Create an AutoCAD template with appropriate settings for different engineering disciplines	Exams, Homework & Lab Exercises
4. Create 2D graphics using standard AutoCAD drafting tools	Exams, Homework & Lab Exercises
5. Input precise coordinates using the Cartesian coordinate system format	Exams, Homework & Lab Exercises
6. Use properties and modify tools to manipulate 2D graphics	Exams, Homework & Lab Exercises
7. Create sheet layouts and produce hard copy prints and plots	Exams, Homework & Lab Exercises
8. Produce quality freehand lettering and basic technical sketches	Homework & Lab Exercises

Other Required Materials:

- AutoCAD software is required for this course

RIT

National Technical Institute for the Deaf Department of Engineering Studies

NPMT-214 CAD Applications

Course Description:

Students develop engineering skills in engineering graphics and solid modeling. Students will use computer-aided drafting (CAD) as a tool to generate 2D graphics and 3D solid models. The course is laboratory oriented and provides the student with basic skills in spatial visualization, freehand sketching, parametric solid modeling, and creation of engineering drawings which meet industrial drafting standards. **Credits: 3**

Goals:

- Understand how to specify and control functional requirements through an engineering design process
- Develop the conceptual and visualization skills required to create and read engineering documentation
- Develop free hand sketching skills to communicate functional requirements of design concepts
- Create detailed engineering drawings in a standard industrial format
- Communicate engineering related solutions using engineering graphics
- Develop reading skills needed to read and understand technical materials related to computer aided drafting applications
- Develop writing skills needed to communicate technical information on the job

Topics:

- Design cycle
- Freehand sketching and visualization
- Creation of 2D drawings
- 3D solid model
- Industry drafting standards
- Geometric Dimensioning and Tolerancing (GD&T)
- Assembly construction
- Rapid Prototype

Learning Outcomes:

Outcome: <i>At the completion of this course, students will be able to:</i>	Assessment Method
1. Apply sketching skills of parts and assembly, concepts, and engineering Graphics	Lab Activities
2. Apply visualization skills such as 2D to 3D conversion and perspective Views	Lab Activities
3. Utilize basic measuring equipment and formulate GD&T specifications of a selected part	Lab Activities

4. Create parts and assemblies using a 3D parametric solid modeling computer program	Lab Activities
5. Generate detailed orthographic and axonometric drawings including proper dimensions, tolerance of parts and notations in a standard industrial format	Lab Activities
6. Calculate size limits based on class of fit	Lab Activities
7. Formulate and organize a design concept	Projects
8. Demonstrate the ability to create quality solid models, engineering drawings and prototypes in a timely fashion	Projects
9. Create an assembly drawing of parts	Projects & Final Exam
10. Demonstrate ability to effectively make presentations	Presentations & Final Exam

Other required materials:

- Maximum of 10 computers which includes an installation of 2D/3D related software such as AutoCAD, SolidWorks and MasterCAM

RIT

National Technical Institute for the Deaf
Department of Science and Mathematics

NMTH-140 Mathematics in Society

Course Description:

This project-based course is intended for students interested in the exploration of mathematical thinking and procedures. It includes applications to real world situations and uses problem solving skills. Topics include number sense, consumer mathematics, introduction to statistics, basic geometry, number representation, and units of measurement including conversion in English and metric systems. **Credits: 3**

Goals:

- To provide and enhance a foundation in mathematical thinking and problem solving
- To explore the interface between language (English and ASL), mathematics and symbol systems
- To actively explore appropriate use of current technology in conjunction with concepts developed in the course
- To develop reading, writing and critical thinking skills related to concepts of mathematics/statistics content
- To apply and practice math skills that will be vital to success in other courses and which are important in the areas of business and the social sciences

Topics:

- Number Sense
 - Applications of Mental Arithmetic
 - Applications of Estimation
 - Review Exponents
 - Relational Operations
 - Scientific Notation
- Consumer Mathematics
 - Review of Percents, Decimals, and Fractions
 - Solving Percent Problems
 - Applications
 - Sales Tax, Sales Price, Income Tax
 - Review Percent of Increase and Decrease
 - Simple and Compound Interest
 - Annuities
 - Installment Loans
- Introduction to Statistics
 - Population vs. Sampling
 - Graphical Presentation of Qualitative and Quantitative Data
 - Measures of Central Tendency: Mean, Median, and Mode
 - Concept of Measures of Dispersion: Range, Standard Deviation

- Concept of Normal Distribution
- Scatterplot and its Correlation
- Concept of a Best-Fit Line
- Units of Measurement & Conversion in the English and Metric Systems
 - Length
 - Area
 - Volume and Capacity
 - Weight and Mass
 - Temperature in Fahrenheit and Celsius Scales
 - Pixel Dimension, Resolution & Image Aspect Ratio
- Geometry
 - Perimeter & Circumference
 - Area
 - Volume
- Number Representation
 - Early and Modern Numeration Systems
 - Simple Grouping Systems: Egyptian
 - Multiplicative Grouping Systems: Chinese
 - Positional Systems: Hindu-Arabic & Roman
 - Base Number Systems
 - Base 10
 - Binary System (Base 2)
 - Octal System (Base 3)
 - Hexadecimal System (Base 16)
 - Base Conversion
 - Operations in Base Number Systems
- Supplemental Project Activities
 - Strategies for Learning Mathematics
 - Getting Extra Help
 - Reading and Using On-Line Materials
 - Writing Mathematically
 - Preparing for Project Management
 - Working and Communicating with other Students
 - Summarizing Learning Outcomes
 - Use of Calculator & Spreadsheet
 - Technical Signs and Mathematics Vocabulary
 - ASL Signs used in Mathematics
 - How the Mathematical Concepts Relate to the Signs

Learning Outcomes:

Outcome: <i>At the completion of this course, students will be able to:</i>	Assessment Method
1. Demonstrate the use of mental arithmetic and estimation	Project & Test
2. Convert very small/large number into scientific notation and vice versa	Project & Test
3. Solve written problems involving percent of increase or decrease, expressing the answer in written English	Project & Test

4. Solve applied problems involving sales tax, discounts and income tax	Project & Test
5. Compute simple/compound interest and future value	Project & Test
6. Determine the value of an annuity and regular payments needed to achieve financial goal	Project
7. Compute the periodic payment needed to meet a goal, for example: a mortgage/purchasing a new car	Project
8. Find the interest, the balance due, and the minimum monthly payment for the credit card loans	Project & Test
9. Describe the difference between a population and a sample	Project & Test
10. Organize and present data visually	Project & Spreadsheet
11. Determine and interpret the mean, median, mode for a data set	Project & Spreadsheet
12. Determine and interpret the range and standard deviation for a data set	Project & Spreadsheet
13. Recognize characteristics of normal distribution and understand the 68-95-99.7 rule	Project & Test
14. Make a scatter plot for a table of data items, draw a best-fit line and interpret information given on the scatter plot	Project & Spreadsheet
15. Convert measurements of length in the English/metric system	Project
16. Convert between English and metric units of length	Project
17. Convert units of area/volume	Project
18. Convert weights in the English/metric system	Project
19. Convert weights in the English/metric system	Project
20. Convert weights between English and metric units	Project
21. Convert temperatures between the Fahrenheit and Celsius scales	Project
22. Solve applied problems involving pixel dimension, resolution and image aspect ratio	Project
23. Calculate perimeters and areas of plane regions and solve applied problems	Project & Test
24. Use formulas to calculate a circle's circumference and area	Project & Test
25. Compute the volumes of three-dimensional figures and solve applied problems	Project & Test
26. Convert between base 10 and other bases	Project
27. Convert between binary, octal, and hexadecimal	Project
28. Add, subtract, multiply and divide in bases other than ten	Project & Test
29. Work with numbers in the Egyptian, Roman & Chinese systems	Project

Other Course Requirements:

- Course should be offered in a room with a SmartBoard and related software, and dual projectors when possible because of the extensive use of technology

RIT

National Technical Institute for the Deaf
Department of Science and Mathematics

NSCI-153 Processes of Science: Environmental Studies

Course Description:

This course covers introductory science processes using the content of environmental studies as a vehicle to establish an appreciation of the scientific method, critical thinking and problem solving. The basic processes of observing, collecting data, classifying, comparing, analyzing and forming hypotheses will be addressed using the concepts of environmental studies.

Credits: 3

Goals:

- To develop reading, writing and analytical skills related to the environmental studies content and to use those skills to develop and revise written laboratory reports
- To enhance skills in communicating scientific ideas and processes in writing and face-to-face, using English and ASL
- To develop students' ability to think critically and solve problems as they relate scientific concepts to real world issues
- To develop skills in observation, basic measurement techniques, data collection, and graphical and analytical interpretation of data

Topics:

- Air Pollution
 - Vehicle Pollution
 - Fuel Economy
 - Alternative Energy Sources
 - Toxic Release Inventory
- Water Pollution
 - Water Quality Monitoring
 - Water Quality Testing (chemical based)
 - Water Quality Testing (species based)
 - Great Lakes
- Environmental Policy
 - Global Warming
 - Environmental Disasters
 - Biodiversity
 - Human Population
 - Overfishing
- Technical signs and science vocabulary
 - ASL signs used in this course
 - How the science concepts relate to the signs

Learning Outcomes:

Outcome: <i>At the completion of this course, students will be able to:</i>	Assessment Method
1. Research and analyze which car is the best through MPG and how high and low MPG impacts the environment	Lab report
2. Research and present various alternative energy sources by showing the pros and cons of the energy source	Presentation, Test
3. Identify trouble areas using Toxic Release Inventory reports	Lab report
4. Use technology to collect water samples to analyze and report findings	Lab report
5. Research and share environmental issues regarding the Great Lakes	Presentation, Test
6. Discuss the importance of Biodiversity	Homework, Test
7. Analyze the impact of human population growth on the environment	Homework, Test
8. Measure the impact of wind on air pollution	Lab report
9. Measure the impact of cars on air pollution	Lab report
10. Measure the impact of overfishing on ecosystem and demonstrate knowledge how to reduce overfishing	Homework, Lab report, Test
11. Demonstrate cooperative problem solving with peers	Lab activities
12. Research multiple environmental disasters and demonstrate how the ecosystem was impacted	Presentation

Other Course Requirements:

- Properly organized, equipped, and maintained science lab and access to computers

RIT

National Technical Institute for the Deaf
Department of Science and Mathematics

NSCI-155 Processes of Science: Biological Studies

Course Description:

This course covers introductory science processes using biology content as a vehicle to establish an appreciation of the scientific method, critical thinking and problem solving. The basic processes of observing, collecting data, classifying, comparing, analyzing and forming hypotheses will be addressed using selected concepts in biology. **Credits: 3**

Goals:

- To develop reading, writing and analytical skills related to selected concepts in biology and to use those skills to develop and revise written laboratory reports
- To enhance skills in communicating scientific ideas and processes in writing and face-to-face, using English and ASL
- To develop students' ability to think critically and solve problems as they relate scientific concepts to their health and development
- To develop skills in observation, basic measurement techniques, data collection, and graphical and analytical interpretation of data

Topics:

- The Scientific Method and Hypotheses
- Homeostasis in the human body
 - Circulatory System
 - Respiratory System
 - Excretory System
- Human Nutrition
 - Macromolecules
 - Digestive System
- Human Development
 - Cells
 - Mitosis and Meiosis
 - Reproductive System
- Human Inheritance
 - Genetics
 - Biotechnology
- Human Disease
 - Bacteria & Viruses
 - Circulatory System Diseases
 - Respiratory System Diseases
 - Excretory System Diseases
 - Digestive System Diseases
 - Reproductive System Diseases

- Cancer
- Technical signs and science vocabulary
 - ASL signs used in this course
 - How the science concepts relate to the signs

Learning Outcomes:

Outcome: <i>At the completion of this course, students will be able to:</i>	Assessment Method
1. Apply the process of the scientific method to formulate a hypothesis	Lab work & Laboratory Reports
2. Provide examples of homeostasis within the human body	Assignments, Quizzes, & Exams
3. Describe the function of the following body systems: circulatory, respiratory, excretory, digestive, reproductive	Assignments, Quizzes, & Exams
4. Describe the structure of the heart and blood flow through it using correct anatomical terminology	Assignments, Quizzes, & Exams
5. Identify the flow of deoxygenated and oxygenated blood through the pulmonary and systemic circuits	Assignments, Quizzes, & Exams
6. Compare the structure and function of the three types of blood vessels	Assignments, Quizzes, & Exams
7. Discuss the dangers of high blood pressure and artery damage	Assignments, Quizzes, & Exams
8. Explore the role of lifestyle in cardiovascular disease	Assignments, Quizzes, & Exams
9. Identify and describe the major components of blood and their function	Assignments, Quizzes, & Exams
10. Differentiate between different blood types and explain the requirements for blood donors and recipients	Assignments, Quizzes, & Exams
11. Calculate max heart rate and target heart rate for a given age	Lab work & Laboratory Reports
12. Identify the structures of the upper and lower respiratory tracts and their functions	Assignments, Quizzes, & Exams
13. Discuss how gas is exchanged through the alveoli	Assignments, Quizzes, & Exams
14. Describe the main disorders of the lower and the upper respiratory tracts	Assignments, Quizzes, & Exams
15. Explain how the nephrons of the kidney filter the blood	Assignments, Quizzes, & Exams
16. Discuss common excretory system disorders	Assignments, Quizzes, & Exams
17. Classify chemical structures of various biological macromolecules	Assignments, Quizzes, & Exams
18. Explain the structures, processes and functions of the organs in the digestive system	Assignments, Quizzes, & Exams
19. Differentiate between type 1 diabetes and type 2 diabetes and explain how the condition arises	Assignments, Quizzes, & Exams
20. Explain the following nutrition disorders: obesity, bulimia nervosa, anorexia nervosa, malnutrition	Assignments, Quizzes, & Exams
21. Identify organelles when presented a picture of a cell	Assignments, Quizzes, & Exams

22. Explain the function of cellular organelles	Assignments, Quizzes, & Exams
23. Identify and draw various tissue types from prepared slides	Lab work & Laboratory Reports
24. Differentiate between the processes of mitosis and meiosis	Assignments, Quizzes, & Exams, Lab work
25. Discuss common reproductive diseases and disorders	Assignments, Quizzes, & Exams
26. Perform analyses of Punnett squares and stated predicted ratios of phenotypes and genotypes	Assignments, Quizzes, & Exams
27. Perform DNA gel electrophoresis	Lab work & Laboratory Reports
28. Read plasmid maps and predict DNA fragment sizes	Lab work & Laboratory Reports
29. Graph data collected from antibiotic sensitivity testing	Lab work & Laboratory Reports
30. Explain the process of invasive cancer	Assignments, Quizzes, & Exams

Other Course Requirements:

- Properly organized, equipped, and maintained science lab and access to computers
- Lab coats or aprons, goggles, gloves
- Electrophoresis equipment for testing DNA samples
- Lung model
- Blood pressure cuff
- Prepared slides of cells (histology)
- Urinalysis kit (Ward's)
- Materials for dissections (kidneys, hearts, fetal pigs; dissection tray, dissection tools)
- Stopwatches/timers
- Petri dishes, TSA agar, antibiotic discs

RIT

National Technical Institute for the Deaf
Department of Science and Mathematics

NSCI-156 Processes of Science: Forensics

Course Description:

This course covers introductory science processes using the content of forensics as a vehicle to establish an appreciation of the scientific method, critical thinking and problem solving. The basic processes of observing, collecting data, classifying, comparing, analyzing and forming hypotheses will be addressed using the concepts of forensics. **Credits: 3**

Goals:

- To develop reading, writing and analytical skills related to the forensics content and to use those skills to develop and revise written laboratory reports
- To enhance skills in communicating scientific ideas and processes in writing and face-to-face, using English and ASL
- To develop students' ability to think critically and solve problems as they relate scientific concepts to real world issues
- To develop skills in observation, basic measurement techniques, data collection, and graphical and analytical interpretation of data

Topics:

- Forensic Concepts and Terms
- Prediction and Hypothesis
- Documenting a Crime Scene
- Crime Scene Analysis
 - Using actual data
 - Using news articles
- Laboratory Techniques
 - Blood
 - Hair
 - Fingerprints
 - DNA
 - Urine Analysis
- Writing a Formal Laboratory Report
- Technical signs and science vocabulary
 - ASL signs used in this course
 - How the science concepts relate to the signs

Learning Outcomes:

Outcome: <i>At the completion of this course, students will be able to:</i>	Assessment Method
1. Explain the basic terminology that applies to the field of forensics (evidence, alibi, motive, etc.)	Quizzes, Homework & Labs
2. Differentiate between the terms prediction and hypothesis	Quizzes, Homework & Labs
3. Given scenarios, determine the reason for experimentation, the hypothesis for the experiment and make predictions based on the data presented	Quizzes, Homework & Labs
4. Given data, use Excel to produce a graphical representation of the data	Laboratory Reports
5. Analyze given data and provide an explanation for the outcomes of an experiment	Quizzes, Homework &
6. Write a lab report with all of the required sections and necessary content	Laboratory Report
7. Describe the steps necessary for documenting a crime scene	Quizzes, Homework & Labs
8. Given a crime scene, document and record the data	Lab work
9. Differentiate between the different types of fingerprints	Quizzes, Homework & Labs
10. Given unknown fingerprints, match them with known fingerprints	Lab work
11. Given articles of recent crimes in the US, list the evidence that lead to the capture of the convict	Quizzes, Homework & Labs
12. Using anti-serum, identify blood types of unknown samples	Lab work
13. Identify the structures of a strand of hair and explain how hair differs between races and species	Quizzes, Homework & Labs
14. Using a microscope, match unknown hair samples with known hair samples	Lab work
15. Explain the purpose of restriction enzymes for analyzing DNA	Quizzes, Homework & Labs
16. Using electrophoresis, analyze known and unknown samples of DNA	Lab work

Other Course Requirements:

- Properly organized, equipped, and maintained science lab and access to computers
- Electrophoresis equipment for testing DNA samples
- Other equipment and consumables including micropipettes, fake blood, hair samples, ink pads, etc.