INFORMATION TECHNOLOGY CAREER CLUSTER DESIGN

Approved Pathway:

1) Includes minimum of three secondary-level credits.
2) Includes a work-based element.
3) Consists of a sequence: Introductory-level, Technical-level, and Application-level courses.
4) Supporting documentation includes Articulation Agreement(s), Certification, Program Improvement Plan, and a Program of Study.
5) Technical-level and Application-level courses receive .5 state-weighted funding in an approved CTE pathway.

Web and Digital Communications Pathway – CIP Code 11.1004

INTRODUCTORY LEVEL

Computing System	10002/60002	1 credit
Computer Applications	10004/60004	1 credit

TECHNICAL LEVEL

Web Page Design	10201	1 credit
Computer Graphics	10202	1 credit
Interactive Media	10203	1 credit
Graphic Design	05162/11154	1 credit
Computer Programming	10152	1 credit
Internet Marketing	12162	1 credit
Animation	10210	1 credit

APPLICATION LEVEL

Particular Topics in Media Technology	10204	1 credit
IB Information Tech. in Global Society	10007	1 credit
Emerging Technologies	10040	1 credit
Game Design & Authoring the Web	10165	1 credit
Web and Digital Communications Project Management	31096	1 credit

KANSAS STATE CAREER CLUSTER COMPETENCY PROFILE
INFORMATION TECHNOLOGY CLUSTER
Web and Digital Communication Pathway – CIP Code 11.1004

STUDENT _____

Rating Scale:

3 - Proficient Achievement

2 - Limited Achievement

1 - Inadequate Achievement

0 - No Exposure

Graduation Date _____

I certify that the student has received training in the areas indicated.

Instructor Signature _____

Instructor Signature _____

Instructor Signature _____

Instructor Signature _____

COMMON CAREER TECHNICAL CORE – CAREER READY STANDARDS

1. Act as a responsible and contributing citizen and employee
2. Apply appropriate academic and technical skills
3. Attend to personal health and financial well-being
4. Communicate clearly, effectively and with reason
5. Consider the environmental, social and economic impacts of decisions
6. Demonstrate creativity and innovation
7. Employ valid and reliable research strategies
8. Utilize critical thinking to make sense of problems and persevere in solving them.
9. Model integrity, ethical leadership and effective management
10. Plan education and career path aligned to personal goals
11. Use technology to enhance productivity
12. Work productively in teams while using cultural/global competence

COMMON CAREER TECHNICAL CORE – INFORMATION TECHNOLOGY CLUSTER STANDARDS

1. Demonstrate effective professional communication skills and practices that enable positive customer relationships.
2. Use product or service design processes and guidelines to produce a quality information technology product or service.
3. Demonstrate the use of cross- functional teams in achieving IT project goals.
4. Demonstrate positive cyber citizenry by applying industry accepted ethical practices and behaviors.
5. Explain the implications of IT on business development.
6. Describe trends in emerging and evolving computer technologies and their influence on IT practices.
7. Perform standard computer backup and restore procedures to protect IT information.
8. Recognize and analyze potential IT security threats to develop and maintain security requirements.
9. Describe quality assurance practices and methods employed in producing and providing quality IT products and services.
10. Describe the use of computer forensics to prevent and solve information technology crimes and security breaches.
11. Demonstrate knowledge of the hardware components associated with information systems.
12. Compare key functions and applications of software and determine maintenance strategies for computer systems.

INTRODUCTORY LEVEL COURSES

10002 Computing Systems

Computing Systems courses offer a broad exploration of the use of computers in a variety of fields. These courses have a considerable range of content, but typically include the introduction of robotics and control systems, computer-assisted design, computer-aided manufacturing systems, and other computer technologies as they relate to industry applications.

3 2 1 0   1. **Overview of Systems**
   a.   Identify computer classifications and hardware.
         i.   Identify types of computer storage devices.
         ii.   Identify major hardware components and their functions.
         iii.   Identify the different types of computing devices.
   b.   Identify new IT technologies and assess their potential importance and impact on the future.
   c.   Identify new & emerging drivers and inhibitors of information technology change.
   d.   Operate computer-driven equipment and machines.
   e.   Apply knowledge of operating systems principles to ensure optimal functioning of system.
   f.   Understand data communications trends and issues.
   g.   Demonstrate knowledge of data transmission codes and protocols.
   h.   Understand elements and types of information processing. (i.e., input, process, output).
(e.g., batch, interactive, event- driven, object-oriented).

3 2 1 0   **2. Computer Operations**
   a.   Identify and understand the fundamentals of operating systems and their components.
   b.   Configure systems to provide optimal system interfaces
   c.   Clearly document step-by-step installation procedures for future use and configuration.
   d.   Apply concepts of privileged instructions and protected mode programming.
   e.   Configure peripheral device drivers (e.g., disk, display, printer, modem, keyboard, and mouse).
   f.   Allocate disk space, non-sharable resources, and I/O devices.
   g.   Interface peripheral devices/controllers in the computer system (e.g., software and hardware interrupts, exceptions, Direct Memory Addressing [DMA], bus structures).
   h.   Identify standards and issues related to I/O programming and design of I/O interfaces.
   i.   Define hardware-software interface issues for a computer system.
   j.   Review automated scheduling software and Identify scheduling priority in programming.
   k.   Document procedures and actions through development of audit trails.

3 2 1 0   **3. Hardware**
   a.   Ensure that hardware and software system components are compatible and licensed prior to performing installation.
   b.   Evaluate systems engineering considerations.
   c.   Demonstrate knowledge of how bandwidths affect data transmission and on-screen image.
   d.   Evaluate information systems problem-solving techniques and approaches.
   e.   Determine the accuracy and completeness of the information gathered.
   f.   Explain data communications procedures, equipment and media.
   g.   Explain measurement techniques for increased productivity due to information systems implementation.
   h.   Explain the differences between local and wide area networks.
   i.   Explain the benefits of hosting a web site on a local server vs. at an ISP (Internet Service Provider).
   j.   Troubleshoot computer-driven equipment and machines and access support as needed
   (e.g. Test system using diagnostic tools/software, repair/replace malfunctioning hardware and reinstall software as needed, recover data and/or files and restore system to normal operating

standards.)

3 2 1 0 **4. Software**

a. Determine software design process, from specification to implementation and appraise software process and product life cycle models.
b. Explain new and emerging classes of software.
c. Explain the key functions and applications of software.
d. Demonstrate knowledge of the function and operation of compilers and interpreters.
e. Demonstrate knowledge of widely used software applications (e.g., word processing, database management, spreadsheet development, publishing software).
f. Demonstrate an understanding of various programming paradigms (OO, functional, logic) in software development
g. Demonstrate knowledge of how data is organized in software development: source version data, project progress data, etc. to increase individual efficiency and respect team member data.
h. Explain the features and functions of how web browsing software affects the look of a web page, consider the characteristics and uses of plug- ins and examine role of browsers in reading files on the World Wide Web (text-only, hypertext).
i. Explain the role of number systems in information systems and internal data representation.
j. Identify the role the binary system in information systems.

3 2 1 0 **5. Serving the needs of the end user**

a. Communicate to understand the problem the user wants to solve independent of the technology (empathy). Consider develop context awareness -- consider the context of the user and the problem before proposing a solution.
b. Perform software customization as requested to meet the needs of the end user.
c. Perform installation accurately and completely, using available resources as needed.
d. Resolve problems with installation if they occur.
e. Test and maintain products /services.
f. Initiate predictive maintenance procedures.
g. Consider customer satisfaction in determining product characteristics (e.g., usefulness, price, operation, life, reliability, safety, and cost of operation).
h. Use available reference tools (e.g., procedural manuals, documentation, standards, and work flowcharts) as appropriate to access needed information.
i. Use installation/operation manuals to access needed information using appropriate reference materials.
j. Use reliability factors (e.g., cost, human, productivity) to plan for and create products/ services; with consideration of maintainability, good design, design simplification, and design redundancy.
k. Demonstrate knowledge of critical thinking skills, decision-making skills and develop a plan using data-oriented techniques.

10004-Computer Applications

In Computer Applications courses, students acquire knowledge of and experience in the proper and efficient use of previously written software packages. These courses explore a wide range of applications, including (but not limited to) word-processing, spreadsheet, graphics, and database programs, and they may also cover the use of electronic mail and desktop publishing.

3 2 1 0 **1. Personal Information Management**

a. Identify PIM applications (e.g., Essential PIM, MS Outlook, Lotus Notes…) and maintain safe and secure user profiles.
b. Manage daily/weekly/monthly schedule using applications such as. (e.g., Notes, MS Outlook,

calendars/schedules.)

- c. Create reminder for oneself and send notes/ informal memos using PIM applications.
- d. Access email system using login and password functions. Access email messages received
- e. Create and send e-mail messages in accordance with established business standards (e.g., grammar, word usage, spelling, sentence structure, clarity) demonstrating knowledge of email etiquette.
- f. Attach files to send with messages and access and save received attachments.
- g. Demonstrate knowledge of contamination protection strategies for email.
- h. Maintain shared database of contact information.
- i. Participate in virtual group discussions and meetings.

3 2 1 0 **2. Research and Internet**

- a. Test Internet connection.
- b. Navigate web sites using software functions. (e.g., Forward, Back, Go To, Bookmarks). Utilize online tools
- c. Explore the multimedia capabilities of the World Wide Web.
- d. Bookmark web addresses (URLs).
- e. Locate information using appropriate search procedures and approaches through a variety of search engines and Boolean logic.
- f. Access, evaluate accuracy, and compile Internet resource information for a variety of purposes. (e.g., library catalogs, business, technical, commercial, government, educational)
- g. Unpack files using compression software. Organize and archive files.

3 2 1 0 3. **Word Processing and Presentations**

- a. Create/Open Edit and Save documents (e.g., letters, memos, reports) and presentations using existing forms and templates.
- b. Employ word processing utility tools (e.g., spell checker, grammar checker). Locate/replace data using search and replace functions.
- c. Format text using basic formatting functions.
- d. Enhance publications using different fonts, styles, attributes, justification, etc.
- e. Enhance publications using paint/draw functions.
- f. Format new desktop publishing files and recognize the advantages and disadvantages of export options.
- g. Place graphics (e.g., graph, clip art, table) in a document or slide in accordance with basic principles of graphics design and visual communication.
- h. Prepare publications using desktop and cloud publishing applications.

3 2 1 0 **4. Spreadsheets**

- a. Create/Open Edit and Save spreadsheets.
- b. Create charts and graphs from spreadsheets.
- c. Group worksheets.
- d. Input/process data using spreadsheet functions.
- e. Perform calculations using simple formulas.
- f. Locate/replace data using search and replace functions.
- g. Process data using database functions (e.g., structure, format, attributes, relationships, keys).
- h. Perform single- and multiple-table queries (e.g., create, run, save).
- i. Verify accuracy of output.
- j. Maintain shared database of contact information.

3 2 1 0 **6. Ethics and Security**

- a. Demonstrate knowledge of potential internal and external threats to security. Maximize threat reduction.
- b. Assess exposure to security issues.
- c. Demonstrate knowledge of virus protection strategy and ability to load virus detection/protection software.
- d. Identify sources of virus infections and how to remove viruses.

e. Report viruses in compliance with company standards.
f. Ensure compliance with security rules, regulations, and codes.
g. Explore ways to implement countermeasures.
h. Implement security procedures in accordance with business ethics.
i. Document security procedures.
j. Understand how to follow a disaster plan.
k. Understand how to utilize backup and recovery procedures.
l. Maintain confidentiality.
m. Understand how to provide for user authentication (e.g., assign passwords, access level).

3 2 1 0 **7. History / Quality Assurance**
Demonstrate knowledge of the diverse continuous improvement cycles within industry and their characteristics.
(e.g., Baldridge Performance Excellence, Demming, ISO 9000, Six Sigma)

3 2 1 0 **8. Personal Attributes for success. Career Technical Core Skills**.
a. Act as a responsible and contributing citizen and employee
b. Demonstrate effective professional communication skills and practices that enable positive customer relationships.
c. Apply appropriate academic and technical skills
d. Attend to personal health and financial well-being
e. Communicate clearly, effectively and with reason
f. Consider the environmental, social and economic impacts of decisions
g. Demonstrate the use of cross-functional teams in achieving IT project goals.

Demonstrate positive cyber citizenry by applying industry accepted ethical practices and behaviors.

TECHNICAL LEVEL COURSES

10201 Web Page Design

Web Page Design courses teach students how to design web sites by introducing them to and refining their knowledge of site planning, page layout, graphic design, and the use of markup languages—such as Extensible Hypertext Markup, JavaScript, Dynamic HTML, and Document Object Model—to develop and maintain a web page. These courses may also cover security and privacy issues, copyright infringement, trademarks, and other legal issues relating to the use of the Internet. Advanced topics may include the use of forms and scripts for database access, transfer methods, and networking fundamentals.

3 2 1 0 1. Develop flowchart, navigational blueprints and schema.
3 2 1 0 2. Create sample design showing placement of buttons/navigational graphics and uggested color scheme.
3 2 1 0 3. Develop storyboards.
3 2 1 0 4. Demonstrate knowledge of available graphics, video, motion graphics, web software programs.
3 2 1 0 5. Identify how different user agents (browsers, devices) affect the digital communication product.
3 2 1 0 6. Create and produce content.
3 2 1 0 7. Create and refine design concepts.
3 2 1 0 8. Identify, utilize and create reusable components.
3 2 1 0 9. Apply color theory to select appropriate colors.
3 2 1 0 10. Apply knowledge of typography
3 2 1 0 11. Apply principles and elements of design.
3 2 1 0 12. Evaluate visual appeal.

3 2 1 0 13. Demonstrate knowledge of basic web application security.
3 2 1 0 14. Demonstrate knowledge of HTML, XHTML, and CSS.
3 2 1 0 15. Explain importance of web standards.
3 2 1 0 16. Demonstrate knowledge of Web
3 2 1 0 17. Explain the importance of ethical colors.
3 2 1 0 18. Demonstrate knowledge of how to use a scripting language to program a site.
3 2 1 0 19. Describe the function of a non-disclosure agreement (NDA).
3 2 1 0 20. Differentiate between copyright and trademarks.
3 2 1 0 21. Explain the concept of intellectual property.
3 2 1 0 22. Define scope of work to achieve individual and group goals.
3 2 1 0 23. Use available reference tools as appropriate.
3 2 1 0 24. Explain the features and functions of Web browsing software.
3 2 1 0 25. Explain the features and functions of Web page design software.
3 2 1 0 26. Compare and contrast clients and servers.
3 2 1 0 27. Describe how bandwidth affects data transmission and on-screen image.

10202 Computer Graphics

Computer Graphics courses provide students with the opportunity to explore the capability of the computer to produce visual imagery and to apply graphic techniques to various fields, such as advertising, TV/video, and architecture. Typical course topics include modeling, simulation, animation, and image retouching.

3 2 1 0 1. Demonstrate knowledge of the basic principles of motion graphics.
3 2 1 0 2. Demonstrate proficiency in the use of digital imaging.
3 2 1 0 3. Manipulate images, video, and motion graphics.
3 2 1 0 4. Create and refine design concepts.
3 2 1 0 5. Alter digitized images using an image manipulation program.
3 2 1 0 6. Alter digitized video using a video manipulation program.
3 2 1 0 7. Apply color theory to select appropriate colors.
3 2 1 0 8. Apply knowledge of typography.
3 2 1 0 9. Apply principles and elements of design.
3 2 1 0 10. Create and/or implement the look and feel of a product.
3 2 1 0 11. Create graphical images and/or or video elements.
3 2 1 0 12. Enhance digital communication presentation using a photographic process.
3 2 1 0 13. Evaluate visual appeal.
3 2 1 0 14. Produce or acquire graphics content.
3 2 1 0 15. Differentiate between copyright and trademarks.
3 2 1 0 16. Define scope of work to achieve individual and group goals.
3 2 1 0 17. Use available reference tools as appropriate.
3 2 1 0 18. Explain the key functions and applications of software.
3 2 1 0 19. Explain the need for regular backup procedures

10203 Interactive Media

Interactive Media courses provide students with the knowledge and skills to create, design, and produce interactive media products and services. The courses may emphasize the development of digitally generated and/or computer-enhanced media. Course topics may include 3D animation, graphic media, web development, and virtual reality. Upon completion of these courses, students may be prepared for industry certification.

3 2 1 0   1. Demonstrate knowledge of available graphics, video, motion graphics, web software programs.

3 2 1 0   2. Demonstrate knowledge of available project management and collaborative tools.

3 2 1 0   3. Demonstrate knowledge of integrated development environments, such as Dreamweaver, Flash, Waterproof, After Effects, etc.

3 2 1 0   4. Demonstrate proficiency in the use of digital imaging, digital video techniques, and equipment.

3 2 1 0   5. Manipulate images, video and motion graphics.

3 2 1 0   6. Create and produce content. (ITPC01.08.01)

3 2 1 0   7. Create and refine design concepts. (ITPC01.08.01)

3 2 1 0   8. Identify, utilize and create reusable components. (ITPC01.08.01)

3 2 1 0   9. Alter digitized images using an image manipulation program. (ITPC01.08.02)

3 2 1 0   10. Apply color theory to select appropriate colors. (ITPC01.08.02)

3 2 1 0   11. Apply knowledge of typography. (ITPC01.08.02)

3 2 1 0   12. Apply principles and elements of design. (ITPC01.08.02)

3 2 1 0   13. Create and/or implement the look and feel of the product. (ITPC01.08.02)

3 2 1 0   14. Create graphical images and videos. (ITPC01.08.02)

3 2 1 0   15. Enhance digital communication presentation using a photographic process. (ITPC01.08.02)

3 2 1 0   16. Evaluate visual appeal. (ITPC01.08.02)

3 2 1 0   17. Demonstrate knowledge of animation techniques.

3 2 1 0   18. Demonstrate knowledge of key frames and frames.

3 2 1 0   19. Demonstrate knowledge that motion graphic meets the validation process and is compatible across multiple browsers or devices.

3 2 1 0   20. Determine purpose of the digital communication product.

3 2 1 0   21. Define the role of individual team members.

3 2 1 0   22. Develop a conceptual model for a team digital communication project.

3 2 1 0   23. Integrate photographically derived images with hand- drawn graphic images.

3 2 1 0   24. Integrate the use of photographic special effects into interactive media presentations.

3 2 1 0   25. Integrate media elements.

3 2 1 0   26. Explain concepts involved in social networking.

3 2 1 0   27. Describe applications and services used to create rich internet applications.

3 2 1 0   28. Identify Web 2.0 solutions.

3 2 1 0   29. Describe the function of a non- disclosure agreement (NDA).

3 2 1 0   30 Differentiate between copyright and trademarks.

3 2 1 0   31. Explain the concept of intellectual property.

3 2 1 0   32. Define scope of work to achieve individual and group goals.

3 2 1 0   33. Use available reference tools as appropriate.

3 2 1 0   34. Explain the key functions and applications of software.

3 2 1 0   35. Explain the need for regular backup procedures.

05162/11154 Graphic Design

Commercial Graphic Design courses teach students to use artistic techniques to effectively communicate ideas and information to business and customer audiences via illustration and other forms of digital or printed media. Topics covered may include concept design, layout, paste-up and techniques such as engraving, etching, silkscreen, lithography, offset, drawing and cartooning, painting, collage and computer graphics.

3 2 1 0 1   1. Determine client's needs and expected outcomes.

3 2 1 0 2. Determine purpose of the digital communication project.
3 2 1 0 3. Determine the digital communication elements to be used.
3 2 1 0 4. Determine the target audience.
3 2 1 0 5. Create and produce content.
3 2 1 0 6. Create and refine design concepts.
3 2 1 0 7. Alter digitized images using an image manipulation program.
3 2 1 0 8. Apply color theory to select appropriate colors.
3 2 1 0 9. Apply knowledge of typography.
3 2 1 0   10. Apply principles and elements of design.
3 2 1 0   11. Create and/or implement the look and feel of the product.
3 2 1 0   12. Create graphical images.
3 2 1 0   13. Evaluate visual appeal.
3 2 1 0   14. Differentiate between copyright and trademarks.
3 2 1 0   15. Define scope of work to achieve individual and group goals.
3 2 1 0   16. Use available reference tools as appropriate.

10152 Computer Programming (eg. Python, Visual Basic, C++, Java, Other Lang.)

Computer Programming courses provide students with the knowledge and skills necessary to construct computer programs in one or more languages. Computer coding and program structure are often introduced with the BASIC language, but other computer languages, such as Visual Basic (VB), Java, Pascal, C++, and COBOL, may be used instead. Initially, students learn to structure, create, document, and debug computer programs, and as they progress, more emphasis is placed on design, style, clarity, and efficiency. Students may apply the skills they learn to relevant applications such as modeling, data management, graphics, and text-processing.

3 2 1 0   1. Summarize the process of IT product/service design.
3 2 1 0   2. Plan for products/services using reliability factors.
3 2 1 0   3. Create products/services using reliability factors.
3 2 1 0   4. Test new products/services for reliability.
3 2 1 0   5. Maintain the reliability of new products/services.
3 2 1 0   6. Identify input and output requirements,
3 2 1 0   7. Identify system processing requirements.
3 2 1 0   8. Define scope of work to meet customer needs.
3 2 1 0   9. Demonstrate knowledge of the key functions and subsystems of the software product.
3 2 1 0   10. Demonstrate knowledge of cross- functional team structures and team members' roles.
3 2 1 0   11. Assess the importance of new technology to future developments.
3 2 1 0   12. Identify data communication trends and major current issues.
3 2 1 0   13. Identify new technologies relevant to information technology.
3 2 1 0   14. Identify system processing requirements.
3 2 1 0   15. Determine compatibility of hardware and software.
3 2 1 0   16. Identify new and emerging classes of software.
3 2 1 0   17. Identify the elements of the information processing cycle (i.e. input, process, output, storage)
3 2 1 0   18. Demonstrate knowledge of software development environment.
3 2 1 0   19. Develop programs using appropriate language.
3 2 1 0   20. Demonstrate knowledge of the information system life cycle.
3 2 1 0   21. Demonstrate knowledge of the concepts of data and procedural representations.
3 2 1 0   22. Demonstrate knowledge of key constructs and commands specific to a language.
3 2 1 0   23. Demonstrate knowledge of how programming control structures are used to verify correctness.

12162 Internet Marketing

Internet Marketing covers the principles and functions of marketing from the standpoint of conducting business on the internet. Typically, students develop such skills as using the internet as a marketing tool, conducting a marketing analysis via the internet, planning marketing support activities, managing an electronic marketing campaign, managing/owning a business via the internet, and analyzing the impact of the internet on global marketing.

3 2 1 0   1. Demonstrate knowledge of cultural implications on design and deployment of digital communication products.

3 2 1 0   2. Demonstrate knowledge of Web Accessibility Initiative priorities.

3 2 1 0   3. Engage in user testing throughout the design and development process.

3 2 1 0   4. Identify optimal strategies for successful interactions with clients and team members.

3 2 1 0   5. Determine client needs and expected outcomes.

3 2 1 0   6. Determine client's privacy policy and expectations.

3 2 1 0   7. Determine the digital communication elements to be used.

3 2 1 0   8. Determine the purpose of the digital communication project.

3 2 1 0   9. Determine the target audience.

3 2 1 0   10. Evaluate requirements data that has been collected from customers and competing web sites.

3 2 1 0   11. Identify and evaluate risks.

3 2 1 0   12. Identify and obtain tools and resources to create a project plan.

3 2 1 0   13. Identify interdependencies.

3 2 1 0   14. Collect and analyze usage statistics.

3 2 1 0   15. Explain the importance of ethical behaviors and legal issues.

3 2 1 0   16. Assess product effectiveness.

3 2 1 0   17. Perform usability tests.

3 2 1 0   18. Define scope of work to achieve individual and group goals.

3 2 1 0   19. Use available reference tools as appropriate.

10210 Animation

This course emphasizes the development of digitally generated and/or computer-enhanced media, including 2D and 3D spatial elements, graphic representation, management of movement, environmental representation [including texture, color, value, form, line, and space], recording media, and distribution tools and methodologies. Instruction provides venue for such sophisticated, programming sequences and methodologies as are integrated into actions of the characters creating new behaviors.

Coursework should represent objectives reflective of the locally adopted process. Those listed below are example/foundational.

Vector Illustration

3 2 1 0 1. Creating vector paths

Creating paths with the pencil tool Creating paths with the pen tool

3 2 1 0 2. Editing vector paths Adjusting anchor points Adding and removing anchor points

3 2 1 0 3. Using mask layers

Advanced Animation Techniques

3 2 1 0 4. Inverse kinematics

Animating shapes using the Bone tool 3 2 1 0 5. Shape tweens and animated masks
Creating a shape-tween animation Adding shape hints & a mask
3 2 1 0 6. Filter animation
Animating a filter and other effects 3 2 1 0 7. Motion editing
Using the Motion Editor
Reusing an animation as a motion preset
Actionscript Animation
3 2 1 0 8. Programming Principles Discussing behaviors & scripting Exploring a scripted
application Preparing symbol instances Reading instance property values Storing values
by using variables
3 2 1 0 9. Event listeners and event handlers
Implementing continuous motion Controlling speed with a variable Stopping motion when a
condition is met
Making a clip move when clicked
3 2 1 0 10. Creating modular code
3 2 1 0 11. Special Classes
Creating a document class Extending the Movie Clip class Associating a custom class with
an object
3 2 1 0 12. Using the Debugger
Interactive Techniques
3 2 1 0 13. Adding audio
3 2 1 0 14. Adding a hyperlink
3 2 1 0 15. Loading text from an external file
Video
3 2 1 0 16. Video basics
Discussing video encoding Converting DV content
3 2 1 0 17. Embedding video
Importing video

APPLICATION LEVEL COURSES

10204 Particular Topics in Media Technology

*Coursework should represent explicit objectives measured against specific target employment skills
that are not available in other courses and should be enumerated in addition to those listed below.*
Possible topics (you will have others): Programming Media Behaviors
Managing cross layer imaging & color separation Sound Integration & Sequencing

3 2 1 0 1. Analyze customer requirements to design and develop a Web or digital communication product.
3 2 1 0 2. Apply the design and development process to produce user-focused Web and digital
communications solutions.
3 2 1 0 3. Write product specifications that define the scope of work aligned to customer requirements.
3 2 1 0 4. Demonstrate the effective use of tools for digital communication production, development and
project management.
3 2 1 0 5. Develop, administer and maintain Web applications.
3 2 1 0 6. Design, create and publish a digital communication product based on customer needs.
3 2 1 0 7. Evaluate the functionality of a digital communication product using industry accepted techniques
and metrics.
3 2 1 0 8. Implement quality assurance processes to deliver quality digital communication products and
services.

3 2 1 0 9.　Perform maintenance and customer support functions for digital communication products.

3 2 1 0 10.　Comply with intellectual property laws, copyright laws and ethical practices when creating Web/digital communications.

10007 IB Information Technology in Global Society

Coursework should represent objectives specific to International Baccalaureate Specifications and Portfolio Guide. Those listed below are example only.

3 2 1 0 1. Is able to explain the following topics:

a. basic electronics components (such as transistors BJT, FET, IGFET, MOSFET, SCR and diodes)

b. circuit functions (such as switching amplifiers, voltage regulation, limiters and rectification)

c. circuit breakers and fuses

d. construction of conductors and insulators (such as examples of various cables, shielding and failure mechanisms)

f. electron theory

g. inductance, capacitance, impedance, resonance and reactance

h. instrumentation schematics, control circuitry, ground detection and protective relaying (including the use of associated drawings for diagnosing circuit trouble)

i. magnetism (such as Faraday's Law of Induction, Lenz's Law, amp-turns, volt-turns, B&H fields)

j. relays

k. series, parallel and combination circuits applied to AC and DC circuits

l. Thevenin's and Norton's theorems

m. Theory of operation of plant electrical components

　　i. motors (such as types and classifications)

　　ii. generators (such as types and classifications)

　　iii.　transformers

n. types, functions and operation

o. fault symptoms and hazards

p. safety and environmental

q. precautions associated with cooling mediums (such as oil, air, hydrogen)

r. fire protection systems

s. voltage regulators

t. linear and switching power supplies

u. inverters (such as battery backup systems)

3 2 1 0 2. Diagnoses problems and performs maintenance on the following equipment

a. electrical supply components

　　i.　switchgear, load centers and motor control centers

　　ii.　transformers

　　iii.　inverters and uninterruptible power supplies

　　iv.　circuit breakers

　　v.　batteries and chargers

b. electrical control components

　　i. relays

　　ii. meters

　　iii. control circuits

　　iv. cables

c. resistive electrical equipment
　　　　　　　　i. heaters
　　　　　　　　ii. heat tracing
　　　　d. rotating equipment
　　　　　　　　i. motors
　　　　　　　　ii. generators
　　　　　　　　iii. motor-generators
　　　　e. Structural and auxiliary equipment
　　　　　　　　i. hoists and cranes
　　　　　　　　ii. fire barriers
　　　　　　　　iii. electric boilers
　　　　　　　　iv. elevators
　　　　f. valve actuators
　　　　g. manual operation
　　　　h. testing
　　　　i. position indication
　　　　j. environmental impact
3 2 1 0 3. Explains detailed construction and use of the following:
　　　　a. battery systems
　　　　b. cathodic protection systems
　　　　c. electrical distribution, including alternating and direct current systems
　　　　d. emergency power systems
　　　　e. generator excitation and control systems
　　　　f. protective relaying systems
　　　　g. station heat tracing systems
　　　　h. transformer systems and auxiliaries
3 2 1 0 4. Is able to perform the following specialized tasks
　　　　a. breaker operation, setting, adjustment and repair
　　　　b. motor-operated valve diagnostic testing
　　　　c. motor overhauls
　　　　d. high potential ("hi-pot") tests
　　　　e. stress relief of major components
　　　　f. high voltage connection preparation
　　　　g. relay setting, adjustment, calibration and repair
　　　　h. special soldering
　　　　i. tempering and annealing
　　　　j. battery load testing
　　　　k. switchgear testing

　　　INSTRUMENT & CONTROL TECHNICIANS (for
　　　Additional details on required competencies, go to www.isu.edu/estec or
　　　www.centralia.edu/coe) Maintain and Repair Equipment
3 2 1 0 5. Is able to describe the following:
　　　　a. advanced electronics theory, including operational amplifiers, integrated circuits and
　　　　　solid state circuitry
　　　　b. digital electronics, including the different type of logics used and methods for programming
　　　　　and controlling circuit timing
　　　　d. electrical circuit and instrument loop schematics

e. pneumatic and hydraulic valve operator fundamentals

f. principles of operation of on-line chemistry instrumentation such as conductivity analyzers, turbidity

g. detectors and dissolved oxygen instruments

h. process measurement systems for pressure, temperature, flow, level and vibration

i. process control, loop tuning and control fundamentals

3 2 1 0 6.   Diagnoses problems and performs maintenance on the following components

a. electronic equipment

b. computers/microprocessors

c. analyzers

d. signal converters

e. electrical components such as power supplies, transformers, breakers & relays

f. fire barriers

g. hoists and cranes

h.instrumentation components, including problems associated with placing components into or out of service (such as valving transmitters being placed into service)

i. sensors and detectors

    i. transmitters and indicators

    ii. recorders and annunciators

    iii.controllers and positioners

k. structural and auxiliary equipment

l. valve actuators

    i. manual operations

    ii. alignment for remote control and/or automatic operation

    iii.testing

    iv.position indication

    v. impact of environmental conditions

3 2 1 0 7. Troubleshoots and repairs the following systems and equipment

a. analytical equipment

b. circuit boards

c. computers

d. turbine control system

e. variable-speed pump controls

10040 Emerging Technologies

Coursework should represent objectives reflective of the locally adopted process. Those listed below are example/foundational only.

3 2 1 0   1. Demonstrate the research skills necessary to identify and evaluate emerging technologies

3 2 1 0   2. Seek and identify sources of information on new technology.

3 2 1 0   3. Identify solutions and problems that go beyond the expected and obvious.

3 2 1 0   4. Identify sciences and technology areas most impacted and with most potential to utilize the new technologies.

3 2 1 0 5. Be able to explain why it is important for STEM professionals to keep abreast of evolving technologies.

3 2 1 0 6. Be able to discuss the advantages, disadvantages, and prospects of current emerging technologies.

3 2 1 0 7. Discuss in depth a chosen emerging technology, based on independent research.

3 2 1 0 8. Explain the change process.

3 2 1 0 9. Develop a plan for anticipating change.

3 2 1 0 10. Address each of the following areas to varying degrees based on available information:
  a. anticipated employment,
  b.   drivers and constraints,
  c.   size and location of market,
  d. connection(s) to existing technologies,
  e.   ability and ease of replication,
  f.   physical and capital costs,
  g. industry and education partnerships to be leveraged,
  h. national best practices,
  i. illustrate qualifications, and recommendations, aims and approaches for the Technological innovation
  j. Innovation system modeling
  k. Technology monitoring, forecasting and assessment
  l. Trend analysis methods & scenarios
  m. Impact assessment
  n. Risk analysis
  o. Action (policy) analysis
  p. Technology road mapping
  q. Communication and implementation of innovation forecasts

10165 Game Design & Authoring the Web

Game technologies represent the culmination of logic, sequence, tool utilization, and extension of skill. Programming process for this course will utilize all previously learned factors of programming logic, artistry, and interactivity.

3 2 1 0 1. Summarize the process of IT product/service design.
3 2 1 0 2. Plan for products/services using reliability factors.
3 2 1 0 3. Create products/services using reliability factors.
3 2 1 0 4. Test new products/services for reliability.
3 2 1 0 5. Maintain the reliability of new products/services.
3 2 1 0 6. Identify input and output requirements
3 2 1 0 7. Identify system processing requirements
3 2 1 0 8. Define scope of work to meet customer needs
3 2 1 0 9. Demonstrate knowledge of the key functions and subsystems of the software product
3 2 1 0 10. Demonstrate knowledge of cross- functional team structures and team members' roles.
3 2 1 0 11. Assess the importance of new technology to future developments.
3 2 1 0 12. Identify data communication trends and major current issues.
3 2 1 0 13. Identify new technologies relevant to information technology.
3 2 1 0 14. Identify system processing requirements.
3 2 1 0 15. Determine compatibility of hardware and software.
3 2 1 0 16. Identify new and emerging classes of software.
3 2 1 0 17. Identify the elements of the information processing cycle(i.e., input, process, output, storage)
3 2 1 0 18. Demonstrate knowledge of software development environment.
3 2 1 0 19. Develop programs using appropriate language.
3 2 1 0 20. Demonstrate knowledge of the information system life cycle.
3 2 1 0 21. Demonstrate knowledge of the concepts of data and procedural representations.
3 2 1 0 22. Demonstrate knowledge of key constructs and commands specific to a language
3 2 1 0 23. Demonstrate knowledge of how programming control structures are used to verify correctness.

3 2 1 0 24. Demonstrate Understanding of Gaming Framework Basics
   a.   Creating 3D objects
   b.   Handling input to move our camera 3 2 1 0
   c.   25. Utilize Content Pipeline
   a.   Loading & Texturizing 3D Objects
   b.   Sound and Music
   c.   Extending the content pipeline
3 2 1 0 26. Demonstrate usage of 2D Objects and Effects
   a. 2D Basics
   b. 2D Effects
   c. Creating a 2D game
3 2 1 0 27.Program Handheld Devices (or
   simulated environment)
   a. Programming for the Handheld
   b. Running the game on the handheld
3 2 1 0 28. Utilize High Level Shader Language
   a. HLSL Basics
   b. Advanced HLSL
3 2 1 0 29. Utilize Physics and Artificial
   Intelligence
   a. Physics Basics
   b. Finite State Machines and Game State Management
   c. AI Algorithms
3 2 1 0 30. Utilize 3D Effects
   a. Advanced Texturing Techniques
   b. Special Effects
   c. Particle System
3 2 1 0 31. Demonstrate Successful Debugging
   a. Creating a 3D Game
   b. Improving the Game
   c. Finishing Touches
3 2 1 0 32. Demonstrate Understanding of Networking Framework
   a. Networking Basics
   b. Creating Multiplayer Demos
   c. Creating a Networking Game Skeleton
   d. D. Creating a Turn-based Multiplayer Game
   e. Creating a Real-time Multiplayer Game

31096 WEB AND DIGTAL Communications Project Management and Resource Scheduling

The Web and Digital Communications Project Management course provides students with the information and skills necessary for success in managing projects and operating logistical ventures in technology, business, and industry. This course covers scheduling of resources (including personnel, budget, timelines, and equipment), utilization of Gantt charts, economic principles within the workplace, and risk management. Other possible topics include developing a business plan, finance, business law, marketing and promotion strategies, insurance employee/employer relations, problem-solving and decision-making, and building leadership skills. These courses may also incorporate a survey of the careers within technology and engineering industries.

Web and Digital Communications Competencies

3 2 1 0 1. Analyze customer requirements to design and develop a Web or digital communication product.
3 2 1 0 2. Apply the design and development process to produce user-focused Web and digital communications solutions.
3 2 1 0 3. Write product specifications that define the scope of work aligned to customer requirements.
3 2 1 0 4. Demonstrate the effective use of tools for digital communication production, development and project management.
3 2 1 0 5. Develop, administer and maintain Web applications.
3 2 1 0 6. Design, create and publish a digital communication product based on customer needs.
3 2 1 0 7. Evaluate the functionality of a digital communication product using industry accepted techniques and metrics.
3 2 1 0 8. Implement quality assurance processes to deliver quality digital communication products and services.
3 2 1 0 9. Perform maintenance and customer support functions for digital communication products.
3 2 1 0 10. Comply with intellectual property laws, copyright laws and ethical practices when creating Web/digital communications.

Project Management Competencies
3 2 1 0 1. Recognize different resource types (Work, Material, Cost, Budget, Personnel/Skills, Generic, etc)
3 2 1 0 2. Understand the concept of scope and demonstrate in context of assessing the size of a project.
3 2 1 0 3. Develop plans for project management and resource scheduling.
3 2 1 0 4. Identify key personnel and responsibilities for project.
3 2 1 0 5. Develop SWOT analysis [Strengths, Weaknesses, Opportunities, and Threats] for project.
3 2 1 0 6. Analyze workload of tasks and projects.
3 2 1 0 7. Determine required personnel groups and management hierarchy.
3 2 1 0 8. Determine resources necessary for project completion.
3 2 1 0 9. Determine essential tasks necessary for project completion.
3 2 1 0 10. Design potential timelines for assignments.
3 2 1 0 11. Explore appropriate technologies for project management and resource scheduling.
3 2 1 0 12. Create and present a project management and resource scheduling plan.
3 2 1 0 13. Create Gantt charts.
3 2 1 0 14. Evaluate and assign resources to tasks.
3 2 1 0 15. Implement project management skills to design and complete a collaborative project.
3 2 1 0 16. Learn various survey strategies to track project progress.
3 2 1 0 17. Develop strategies for monitoring interconnected assignments.
3 2 1 0 18. Survey strategies for critical path scheduling.
3 2 1 0 19. Create strategies to manage project budgets.
3 2 1 0 20. Build survey analysis for customer satisfaction