

# Computer Applications (2011): Grades 9, 10, 11, 12

Adopted 2011

## Computer Applications

### 1. Personal Information Management

- a. Create calendars/schedules.
- b. Document results.
- c. Create tasks (to-do) list.
- d. Identify PIM applications (MS Outlook, Lotus Notes, and others).
- e. Manage daily/weekly/monthly schedule using applications such as Notes, MS Outlook, etc.
- f. Create and send notes, informal memos, reminder using PIM applications.
- g. Create reminder for oneself.
- h. Access email messages received.
- i. Access email system using login and password functions.
- j. Create e-mail messages in accordance with established business standards (e.g., grammar, word usage, spelling, sentence structure, clarity, email).
- k. Demonstrate knowledge of email etiquette.
- l. Send email messages.
- m. Access email attachments.
- n. Attach documents to messages.
- o. Demonstrate knowledge of contamination protection strategies for email.
- p. Save email messages/attachments.

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## 2. Research and Internet

- a. Locate information using search engine(s) and Boolean logic.
- b. Navigate web sites using software functions.
- c. Select appropriate search procedures and approaches.
- d. Select search engine(s) to use.
- e. Access business and technical information using the Internet.
- f. Access commercial, government, and education resources.
- g. Evaluate Internet resources (e.g., accuracy of information).
- h. Explore browser features.
- i. Test Internet connection.
- j. Unpack files using compression software.
- k. Bookmark web addresses (URLs).
- l. Navigate web sites using software functions (e.g., Forward, Back, Go To, Bookmarks).
- m. Access library catalogs on the Internet.
- n. Compile a collection of business sites (e.g., finance and investment).
- o. Add plug-ins and helpers to the web browser.
- p. Archive files.
- q. Explore the multimedia capabilities of the World Wide Web.
- r. Utilize online tools.
- s. Communicate via email using the Internet.
- t. Explore collaboration tools.
- u. Explore electronic commerce.
- v. Explore newsgroups.
- w. Compile a collection of business sites (e.g., finance and investment).

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### 3. Word Processing and Presentations

- a. Create documents (e.g., letters, memos, reports) using existing forms and templates.
- b. Employ word processing utility tools (e.g., spell checker, grammar checker, thesaurus).
- c. Format text using basic formatting functions.
- d. Retrieve existing documents.
- e. Safeguard documents using name and save functions.
- f. Create new word processing forms, style sheets, and templates.
- g. Enhance publications using different fonts, styles, attributes, justification, etc.
- h. Enhance publications using paint/draw functions.
- i. Format new desktop publishing files.
- j. Output desktop publishing files.
- k. Place graphics in document.
- l. Prepare publications using desktop publishing software.
- m. Use advanced formatting features (e.g., headers/footers/dropped caps, and indexing).
- n. Create computer presentation and handouts in accordance with basic principles of graphics design and visual communication.
- o. Edit presentations.
- p. Insert graphic elements (e.g., graph, clip art, table) in a slide.
- q. Identify hardware items that support presentation software (e.g., scanners, digital cameras, printers, and projection systems).
- r. Print a single slide, an entire presentation, an outline, and notes.
- s. Run slide shows manually and automatically.

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### 4. Spreadsheets

- a. Create spreadsheets.
- b. Edit spreadsheets.
- c. Print spreadsheets.
- d. Retrieve existing spreadsheets.
- e. Save spreadsheets.
- f. Create charts and graphs from spreadsheets.
- g. Group worksheets.
- h. Input/process data using spreadsheet functions.
- i. Perform calculations using simple formulas.

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## 5. Data

- a. Enter data using a form.
- b. Locate/replace data using search and replace functions.
- c. Process data using database functions (e.g., structure, format, attributes, relationships, keys).
- d. Perform single- and multiple-table queries (e.g., create, run, save).
- e. Print forms, reports, and results of queries.
- f. Search a database table to locate records.
- g. Sort data using single- and multiple-field sorts.
- h. Verify accuracy of output.
- i. Maintain shared database of contact information.
- j. Manage daily/weekly/monthly schedule using applications.
- k. Participate in virtual group discussions and meetings.
- l. Apply basic commands of operating system software.
- m. Employ desktop operating skills.
- n. Apply appropriate file and disk management techniques.
- o. Recognize the need for regular backup procedures.
- p. Demonstrate knowledge of central processing unit (CPU) control and architecture.
- q. Identify CPU modes of operations.
- r. Define the role of memory management in an operating system.
- s. Demonstrate knowledge of network operating systems.
- t. Demonstrate knowledge of operating system architecture types.
- u. Demonstrate knowledge of the commands used to handle tasks in operating systems.
- v. Differentiate between microcomputer, minicomputer, and mainframe operating systems.
- w. Demonstrate knowledge of the basics of process management.
- x. Demonstrate knowledge of the system utilities used for file management.

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## 6. Ethics and Security

- a. Demonstrate knowledge of potential internal and external threats to security.
- b. Assess exposure to security issues.
- c. Demonstrate knowledge of virus protection strategy.
- d. Ensure compliance with security rules, regulations, and codes.
- e. Explore ways to implement countermeasures.
- f. Implement security procedures in accordance with business ethics.
- g. Maximize threat reduction.
- h. Document security procedures.
- i. Understand how to follow a disaster plan.
- j. Identify sources of virus infections.
- k. Understand how to utilize backup and recovery procedures.
- l. Understand how to load virus detection and protection software.
- m. Maintain confidentiality.
- n. Understand how to provide for user authentication (e.g., assign passwords, access level).
- o. Understand how to remove viruses.
- p. Report viruses in compliance with company standards.
- q. Identify the features and benefits of quality planning.
- r. Identify the role of quality within the organization.

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## 7. History / Quality Assurance

- a. Demonstrate knowledge of changes brought about by quality industry leaders in the world.
  - b. Demonstrate knowledge of successful efforts by industry to improve quality and/or reduce costs.
  - c. Demonstrate knowledge of the historical evolution of quality assurance/total quality management (e.g., Deming, ISO 9000).
  - d. Demonstrate knowledge of the standards/requirements for the Baldrige award.
  - e. Demonstrate knowledge of quality management terminology.
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## Pathway Foundation

### Problem Solving and Critical Thinking

1. Demonstrate knowledge of the process required to evaluate and verify the nature of a problem.
    - a. Demonstrate knowledge of the underlying concepts of the information systems discipline.
    - b. Demonstrate knowledge of methods for achieving productivity in knowledge work.
    - c. Apply general systems theory to the analysis and development of an information system.
    - d. Identify procedures for formal problem-solving.
    - e. Demonstrate knowledge of the fundamental concept of information theory and organizational system processes.
    - f. Identify the essential properties of information systems.
  2. Demonstrate knowledge of the process required to solve a problem.
    - a. Demonstrate knowledge of problem-solving steps and techniques.
    - b. Summarize application planning, development, and risk management for information system.
    - c. Identify potential problems in system implementation.
    - d. Demonstrate knowledge of the information analysis process.
    - e. Demonstrate knowledge of information technology solutions.
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## Cluster Foundation

## Employability and Career Development

1. Demonstrate ability to evaluate and compare employment opportunities and accept employment.
  - a. Identify job advantages and disadvantages.
  - b. Compare job benefits to individual needs.
  - c. Compare job opportunities and responsibilities to career plan.
  - d. Make decision to accept or reject employment.
  - e. Write acceptance or rejection letter without error.
  - f. Complete employment forms upon acceptance.
2. Demonstrate ability to seek and apply for employment.
  - a. Identify resources for finding employment.
  - b. Analyze resources to determine those that are most appropriate for desired career.
  - c. Compare job requirements with personal qualifications, interests, and aptitudes.
  - d. Select job that matches personal qualifications, interests, and aptitudes.
  - e. Identify prospective employer's submission requirements.
  - f. Gather information and prepare rough draft of resume.
  - g. Put resume in proper format.
  - h. Write letter of application for specific job opening in correct format, without error.
  - i. Gather information for application.
  - j. Complete all questions on application with appropriate and honest answers.
  - k. Sign and date application.
  - l. Attach any supporting material required or requested.
  - m. Submit full application package to employers.
  - n. Dress appropriately for interview.
  - o. Exhibit professional conduct before, during and after interview.
  - p. Explain your qualifications and interests clearly and concisely.
  - q. Answer all questions honestly and concisely.
  - r. Write follow-up letter after the interview.
3. Demonstrate knowledge of career development/progression patterns in the IT industry.
  - a. Identify education and training requirements for IT career pathways.
  - b. Identify professional organizations in the area of information technology.
  - c. Identify benefits derived from membership in specific professional organizations.

4. Demonstrate knowledge of the relationship between lifelong learning and IT career development.
  - a. Identify present and future IT employment opportunities.
  - b. Demonstrate knowledge of the potential impact of IT on future society.
  - c. Identify the importance of lifelong learning in the IT field.
  - d. Identify certification and/or degree requirements.
  - e. Identify required knowledge and skills for career ladder.
  - f. Research educational and training opportunities.
  - g. Identify present and future IT education and training opportunities.
  - h. Design a lifelong learning plan that ties in with career advancement plan.
5. Develop a personal career plan to meet career goals and objectives.
  - a. Identify career that matches individual interests and aptitudes.
  - b. Develop career goal with time frame.
  - c. Identify goals and objectives for reaching and advancing in career.
  - d. Write a list of strategies for achieving educational requirements.
  - e. Identify strategies for obtaining employment experiences.
  - f. Write a time line for achieving career goals and objectives.
  - g. List alternatives and potential changes.
6. Explain written organizational policies, rules and procedures to help employees perform their jobs.
  - a. Identify the contents of various organizational publications.
  - b. Determine the appropriate document(s) for specific job responsibilities and work assignments.
  - c. Locate and identify specific organizational policy, rule or procedure to assist with a given situation.
  - d. Articulate how a specific organizational policy, rule or procedure will improve a given situation.
7. Identify and demonstrate positive work behaviors and personal qualities.
  - a. Demonstrate regular attendance.
  - b. Follow company dress and appearance standards.
  - c. Exhibit pride in work.
  - d. Demonstrate leadership and teamwork.
  - e. Exhibit ability to handle stress.
  - f. Display initiative and open-mindedness.
  - g. Participate in company orientation and training programs with enthusiasm.
  - h. Identify progressive strategies that will impact efficiency of job.

- i. Follow established rules, regulations and policies.
  - j. Explain employer/management responsibilities.
  - k. Demonstrate cost effectiveness.
  - l. Demonstrate time management.
  - m. Complete all tasks thoroughly.
8. Identify and explore career opportunities in one or more career pathways.
- a. Locate and interpret career information for at least one career cluster.
  - b. Identify job requirements for three career pathways.
  - c. Identify educational and credentialing requirements for three careers.
  - d. Identify personal interests and aptitudes.
  - e. Identify job requirements and characteristics of selected careers.
  - f. Compare personal interests and aptitudes with job requirements and characteristics.
  - g. Modify career goals based on results of personal interests and aptitudes with career requirements and characteristics.
9. Provide examples of how IT is transforming business in various industries.
- a. Demonstrate knowledge of how both PCs and larger computer systems impact people and are used in business/industry/government and other institutions.
  - b. Demonstrate knowledge of the impact of computers on career pathways in business/industry (e.g., how computers have eliminated and created jobs).
  - c. Demonstrate knowledge of the impact of computers on access to information and information exchange worldwide.
  - d. Demonstrate knowledge of ethical issues that have surfaced in the information age.

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## **Ethics and Legal Responsibilities**

1. Demonstrate appropriate knowledge and behaviors of legal responsibilities and of positive cyber-citizenry.
  - a. Demonstrate knowledge of the legal issues that face information technology professionals.
  - b. Identify issues and trends affecting computers and information privacy.
2. Demonstrate knowledge of social, ethical, and legal issues in the information technology field.
  - a. Analyze the social implications of decisions made and actions taken as an information technology professional.
  - b. Demonstrate knowledge of the ethical issues that face information technology professionals.
  - c. Determine the practical implications of lawsuits in terms of good will, client relations, the bottom line, diversion of company resources, cash flow and accounts receivable.
  - d. Demonstrate knowledge of basic business law concepts.
3. Demonstrate knowledge of the rights and responsibilities of IT workers.
  - a. Identify generally accepted business ethics.
  - b. Demonstrate knowledge of federal laws governing discrimination and harassment.
  - c. Demonstrate knowledge of key concepts related to employment discrimination.
  - d. Demonstrate sensitivity to diversity, including differences in gender, culture, race, language, physical and mental challenges, and family structures.
  - e. Establish procedures for maintaining the confidentiality of client information.

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## **Leadership and Teamwork**

1. Build interpersonal skills with individuals and other team members.
  - a. Analyze the interdependence of empathetic listening, synergy, and consensus building.
  - b. Define roles within the group decision-making process.
  - c. Demonstrate knowledge of how to apply team methods to empower coworkers.
  - d. Apply knowledge of group dynamics.
  - e. Promote teamwork, leadership, and empowerment.
  - f. Identify strategies for fostering creativity.
2. Demonstrate knowledge of the skills needed for leadership in the IT environment.
  - a. Demonstrate knowledge of how to apply team methods to empower coworkers.
  - b. Establish goals and objectives for IS.
  - c. Define mission and critical success factors.
  - d. Identify desired group and team behavior in an IS context.

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## **Safety, Health, and Environmental**

1. Maintain a safe working environment.
  - a. Demonstrate knowledge of the relationship between health, safety, and productivity.
  - b. Identify health and safety standards established by government agencies.
  - c. Access needed safety information using company and manufacturers' references (e.g., procedural manuals, documentation, standards, and flowcharts).
  - d. Ensure maintenance of a clean work area.
  - e. Solve safety problems using problem-solving, decision-making, and critical thinking strategies.
  - f. Demonstrate knowledge of ergonomics and repetitive strain injury.

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## Systems

1. Demonstrate knowledge of the nature of IT in business.
    - a. Determine how business activities interface with data processing functions.
    - b. Differentiate between the role of information systems within a company and their role in a global environment.
    - c. Measure increases in productivity realized by the implementation of information systems.
  2. Demonstrate knowledge of the operation of cross-functional teams in achieving project goals.
    - a. Consider the benefits of using a cross-functional team in policy and procedure development.
    - b. Identify desired group and team behavior in an IS context.
  3. Explain/discuss general strategies for maximizing organizational learning and productivity in a high tech environment.
    - a. Assess the importance of new technologies to future developments and to the future knowledge worker productivity.
    - b. Demonstrate knowledge of methods for achieving productivity in knowledge work.
    - c. Create/maintain an environment supportive of productivity.
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## Academic Foundations

### Language Arts

1. Demonstrate language arts knowledge and skills required to pursue the full-range of career and post-secondary education opportunities within the IT career cluster.
  - a. Listen actively.
  - b. Adapt language (diction/structure, style) for audience, purpose, situation.
  - c. Collect/organize oral and written information.
  - d. Compose/edit (agenda, audio-visuals, bibliographies, drafts, forms/documents, notes, oral presentations, reports, technical terminology).
  - e. Comprehend oral and written information (cause/effect, comparisons/contrasts, conclusions, context, purpose, charts/tables/graphs, evaluation/critiques, mood, persuasive text, sequence, summaries, technical matter).
  - f. Evaluate oral and written information (accuracy, adequacy/sufficiency, appropriateness, clarity, conclusions/solutions, fact/opinion, propaganda, relevancy, validity, relationship of ideas).
  - g. Identify oral and written assumptions, purpose, outcomes/solutions, and propaganda techniques.
  - h. Predict outcomes/solutions from oral and written information trends.
  - i. Present formal and informal speech for the purposes of discussion, supplying/requesting information, interpretation, and persuasion.
  - j. Use library, text and Internet resources.

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## Communications

1. Apply active listening skills to obtain and clarify information.
  - a. Determine familiarity of discussion.
  - b. Respond accordingly using appropriate verbal and nonverbal language.
  - c. Explain the message given in your own words.
  - d. Ask questions to seek or confirm understanding.
  - e. Paraphrase and/or repeat information.
  - f. Record and summarize information in written notes.
  - g. Follow directions and/or respond in a positive way with clear, concise comments.
2. Build customer relations.
  - a. Identify organizations' products and services (including own strengths as a sales agent).
  - b. Recognize the importance of all customers to the business.
  - c. Determine customers' individual needs.
  - d. Project a professional business image (e.g., appearance, voice, grammar, word usage, enunciation, nonverbal communication).
  - e. Interact with customers and colleagues in a professional (e.g., prompt, friendly, courteous, respectful, helpful, knowledgeable, and understandable) manner.
  - f. Comply with established business protocols and company policies.
  - g. Communicate company policies to customers.
  - h. Handle merchandise returns in accordance with customer service policy.
  - i. Handle customer complaints in accordance with customer service policy.
  - j. Facilitate customer service through the maintenance of key information systems.
  - k. Follow through on commitments made to customers (e.g., special orders, delivery specifications, new items).
3. Comprehend and use reading strategies to learn meaning, technical concepts, vocabulary, and follow instructions.
  - a. Use reading strategy to achieve intended purpose.
  - b. Identify purpose of text.
  - c. Identify complexity of text.
  - d. Explain purpose of text.
  - e. Determine relevance, accuracy and appropriateness to purpose.
  - f. Identify complexities and discrepancies in information.
  - g. Analyze information presented in a variety of formats, such as tables, lists, figures.
  - h. Identify key technical concepts and vocabulary.

- i. Follow all instructions as specifically given.
  - j. Explain meaning of new terms, vocabulary and concepts.
  - k. Interpret technical materials used.
  - l. Summarize overall meaning of text.
  - m. Write specific steps for applying information to task or new situation.
  - n. Write set of directions for others sharing information learned and applying that to task or new situation.
4. Conduct meetings.
- a. Plan meeting.
  - b. Set agenda.
  - c. Schedule meeting.
  - d. Reserve meeting room.
  - e. Invite appropriate personnel.
  - f. Identify need for outside speakers.
  - g. Assign someone to take minutes.
  - h. Make introductions.
  - i. Invite questions, comments, and group participation.
  - j. Determine appropriate action, time frame, and person accountable for identified tasks.
  - k. Monitor time.
  - l. Publish minutes in timely manner.
5. Demonstrate sensitivity in communicating with a diverse workforce.
- a. Identify factors (e.g., culture, ethnicity, equity, special/exceptional needs) that impact communication.
  - b. Identify strategies for successful communication with a diverse workforce.
  - c. Determine communication style appropriate for listener(s).
  - d. Bridge communication styles.
  - e. Establish guidelines for dealing with conflict.
6. Develop and deliver formal and informal presentations using appropriate media to engage and inform audiences.
- a. Know subject matter well enough to be independent of written aids.
  - b. Identify characteristics of the audience and adjust to their ability to understand.
  - c. Use technical terms and concepts correctly.
  - d. Use proper organization and structure to achieve coherence of major points.
  - e. Identify media and visual aids appropriate to understanding of topic.
  - f. Prepare visual aids and support materials for easy viewing and without error.

- g. Smoothly and efficiently operate any equipment used with support.
  - h. Deliver presentation without grammatical error.
  - i. Speak clearly with appropriate volume, rate and gestures while making and maintaining appropriate eye contact.
  - j. Use support materials in the presentation that enhance the understanding of the topic and the interest level of the audience.
  - k. Stay within presentation time parameters.
  - l. Evaluate listeners' interest and receptiveness.
  - m. Use verbal and nonverbal feedback strategies to engage discussion and adjust message and delivery.
  - n. Respond to questions and comments.
7. Interpret and use tables, charts, and figures to support written and oral communications.
- a. Compile facts and arrange in an organized manner for a table, chart or figure.
  - b. Document sources of data.
  - c. Determine most appropriate way to display data for effective coherence.
  - d. Prepare table, chart, graph or figure for inclusion in publication or presentation.
  - e. Evaluate reference or source of data for authenticity and reliability.
  - f. Explain information presented in tables, charts and figures.
  - g. Prepare written summary of findings expressed in tables, charts and figures.
8. Interpret verbal and nonverbal behaviors to enhance communication with co-workers and clients/participants.
- a. Identify verbal cues.
  - b. Observe voice speed, voice quality and tone.
  - c. Explain message conveyed by verbal behaviors.
  - d. Identify nonverbal cues.
  - e. Observe eye contact, facial expressions, posture, gestures and other body language.
  - f. Explain message conveyed by nonverbal behaviors.
9. Locate, organize and reference written information from various sources to communicate with co-workers and clients/participants.
- a. Identify topic.
  - b. Conduct search of information using card catalog, keywords, and/or search engines.
  - c. Locate variety of resources such as books, journals, and magazines.
  - d. Locate information from electronic forms including the Internet.
  - e. Organize resources to use key information.

- f. Read and take notes from selected resources.
  - g. Prepare outline that emphasizes major points with supporting data.
  - h. Present information in organized, easy-to-follow manner.
  - i. Prepare working bibliography according to MLA, APA, CBE, or Chicago, depending on the warranted language style.
  - j. Prepare a bibliography according to MLA, APA, CBE, or Chicago, depending on the warranted language style.
  - k. Use parenthetical, footnotes and endnotes text citations accurately.
  - l. Follow plagiarism and copyright rules and regulations.
10. Use correct grammar, punctuation and terminology to write and edit documents.
- a. Organize and arrange information for effective coherence.
  - b. Report relevant information in order of occurrence.
  - c. Interpret information, data, and observations correctly.
  - d. Present main ideas and supporting facts.
  - e. Use technical terms and concepts.
  - f. Incorporate and use references effectively and accurately.
  - g. Report objective and/or subjective information.
  - h. Use correct grammar and sentence structure.
  - i. Use correct spelling.
  - j. Use correct punctuation and capitalization.
  - k. Use word processing software to develop text, charts, graphs or figures correctly.
  - l. Use presentation software to prepare visual support materials.
  - m. Format written documents with correct font and layout for easy reading.

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## Mathematics

1. Demonstrate mathematics knowledge and skills required to pursue the full range of career and post-secondary education opportunities within the IT career cluster.
  - a. Identify whole numbers, decimals, fractions, complex numbers, polynomials, and geometrical figures.
  - b. Apply basic arithmetic (addition, subtraction, multiplication, and division) operations.
  - c. Apply relational (equal, not equal, greater than, less than, etc.) and logical operators in a logical expression.
  - d. Understand the relationship of data and measurements to the problem.
  - e. Produce mathematical formulae, expressions, and/or sequence of solution steps from problem statements.
  - f. Analyze problem statements for missing/irrelevant data, estimate/exact values, inconsistent parameters.
  - g. Construct charts/tables/graphs from functions and data.
  - h. Describe problem-solving techniques (e.g., successive approximation, trial and error).

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## Science

1. Demonstrate science knowledge and skills required to pursue the full range of career and post-secondary education opportunities within the IT career cluster.
  - a. Analyze/evaluate conclusions, conflicting data, controls, data, inferences, limitations, questions, sources of errors, and variables.
  - b. Use computers for information processing, mathematical applications and problem-solving.
  - c. Apply/use scientific methods in qualitative and quantitative analysis, data gathering, direct and indirect observation, predictions, and problem identification.