SREB | High Schools That Work

Advanced Career

Global Logistics and Supply Chain Management

Course 1: Introduction to Logistics

Syllabus

College or Career?...Why Not Both?

Advanced Career (AC)

A multi-state consortium to develop curricula, assessments, instructional materials, and teacher/counselor/leader training to provide more students with relevant and challenging career-technical courses

Course Syllabus
Global Logistics and Supply Chain Management
Course 1: Introduction to Logistics

Course Description

This foundational course engages students in contextual problems that introduce them to the concepts of supply chains, warehouse location, contingency planning, in-sourcing and out-sourcing decisions, and expanding existing supply chains. Students will explore these concepts to learn how professionals examine options to maximize the use of resources in establishing physical networks.

This is the first course in the Global Logistics and Supply Chain Management sequence. This course is a prerequisite for participation in other AC Global Logistics and Supply Chain Management courses. There are no prerequisites for participation in this class.

Instructional Philosophy

The Introduction to Logistics course requires AC students to engage in challenging, authentic projects designed to prepare them for employment and options for training and college after high school. Students participate in a variety of learning activities that require the use of technology, software, and academic skills such as reading, writing, mathematics, and science that are essential to success in global logistics and many other high-demand careers.

Students read technical texts in the logistics field to acquire background information and consult other supporting documents to complete project assignments. They maintain and use a Professional Notebook to keep track of notes, logistics, and supply chain management vocabulary, citations, reflections, and project notes gained from background reading and class work. At the conclusion of each project, students develop a written document in a format used in the field to communicate their work to others.

Success in this information-centered economy demands that students be able to read dense technical materials, write about what they have learned, and present their findings orally to various stakeholders. Literacy is a fundamental skill for the 21st century that allows students to apply the varied technical skills that drive the AC curriculum.

Students use scientific information and processes as appropriate to complete the projects. They also apply algebra and statistical concepts learned in high school mathematics courses. At the conclusion of each project, individual students and their teams make an oral presentation to an audience of one or more professionals in logistics, procurement, supply chain management, finance, or other fields related to the project.

AC Global Logistics and Supply Chain students will be expected to meet the following criteria:

Take responsibility for their own learning, demonstrating autonomy and innovation in solving problems. Individual students and student teams take ownership of the project, but teachers provide instruction as needed on skills that increase self-reliance and teamwork. As the student and the team progress through the projects, the teacher gives students additional voice and choice on how to complete the project. Serving as facilitators, teachers ask insightful questions that help students to reflect on their work. They also teach mini-lessons on necessary technical skills that students have been unable to learn independently (e.g., reading strategies for managing difficult reading assignments, writing skills, and mathematics and/or science concepts). Under the guidance of a skilled teacher-facilitator who knows how to ask the right questions, teams increase their independent research and project work. The teacher-facilitator provides criteria to ensure quality work and supports students who need extra help to achieve the high-quality performance expected in AC courses.

Meet high expectations regarding quality of work and personal behavior to ensure success as postsecondary students, employees, business owners, or entrepreneurs. Students arrive at class on time with all necessary materials. They redo major assignments until they meet the high-quality AC standards. They sometimes require before- or after-school tutoring and extra-help sessions. Since AC courses include rigorous work, students can expect to complete homework and out-of-class project assignments.

Work in teams and complete individual assignments related to the team's work. Like teams in the workplace, AC Global Logistics and Supply Chain Management team members are collectively and individually responsible for the success of a project and for ensuring that each team member masters related academic and technical content and demonstrates the 21st-century skills of teamwork, critical thinking, and problem solving. Students evaluate their work and that of other students, using scoring guides provided by the teacher.

Frequently use technology. In Course 1, students use a variety of computer software for spreadsheets, word processing, and presentations. They learn about electronic transportation programs and inventory management software (e.g., Microsoft Dynamics). They use electronic media such as Skype or e-mail to interview professionals in the global logistics field and participate in virtual field trips.

Interact with logistics and procurement experts. As appropriate, students participate in physical or virtual field trips and/or interview professionals by phone or other media. Community experts serve as guest speakers, project mentors, and authentic audience members to provide feedback at the conclusion of each project. Teachers coach students in the behavior and expectations of business professionals. Students exhibit professional standards of dress and behavior.

Adhere to quality and safety standards expected on the job. Students complete class activities, projects, and problems by using the planning and thinking methods of logistics professionals. Throughout the project, the teacher checks for understanding through Professional Notebook entries, questioning, and work reviews. Students use self-evaluation and peer-evaluation scoring guides throughout each project.

Revise work until it meets quality standards. Students complete an end-of-project exam, final products/deliverables, a professionally written report on their work, and an oral presentation at the end of each project.

Take final assessments that mirror final presentations or certification exams in the workplace. The final assessment serves as a means for determining the academic and technical knowledge and skills students acquire through each project. At the completion of Course 1, teachers administer an end-of-course exam to each student. A team consisting of high school and college academic and technical teachers and logistics professionals developed the exam to ascertain mastery of essential academic, technical, and 21st-century knowledge and skills. The exam is similar to employer certification exams. Students read, interpret, paraphrase, summarize, and analyze technical materials; answer technical, mathematics, and science questions; and complete mathematics problems.

Course Goals

Students in Advanced Career (AC) Global Logistics and Supply Chain Management Course 1: Introduction to Logistics will do the following:

- Use terminology of the field.
- Research logistics technical texts, journal articles, and other related documents in developing a plan.
- Use the seven-step decision-making process (i.e., Define the Problem, Develop Approach, Evaluate Constraints, Make Decision, Test Solution, Adjust Solution, Communicate Plan).
- Use logistic concepts to solve problems.
- Relate personal procurement to business principles, including economic implications.
- Use data and logistics tools to make decisions and solve problems.
- Apply project management principles.
- Gain information on how logistics connects the world in the modern economy.
- Understand the career options that suit individual skills.
- Use appropriate and effective research skills.
- Use best practices to design and implement research studies.
- Demonstrate proficiency in word processing, spreadsheets/databases, and presentation software.
- Communicate information, including descriptive statistics, to various audiences.

Major Projects/Problems and Assignments

Course 1 includes the following six projects.

Project 1: Supply Chain Disruptions

Essential Question (EQ): How can we adjust to shortages in a supply chain?

Student teams research the supply chain of a commodity that is essential to the day-to-day operations of their organization. Armed with the knowledge of their established supply chain, teams must then develop a tactical response to various disruptions in the supply chain, such as trade embargoes, political unrest, natural disasters, delays, low crop yields, and other problems. Success will require the ability to diversify sourcing options for the various commodities in a timely manner.

Project 2: Locating a Distribution Center

Essential Question (EQ): How can we determine the locations/sites for distribution centers that will provide the best opportunities for a company's success?

Students assume the role of a site selection specialist who must work with his/her team to identify the best network of distribution centers for an electronics firm looking to create a physical warehousing presence in the United States. Teams will analyze access to ports and other infrastructure considerations of cities across the nation in order to make their recommendations. Analysis of various transportation costs and labor markets will also allow teams to decide just how many distribution centers are needed to maximize responsiveness to the market while minding the bottom dollar.

Project 3: Inventory Management

Essential Question (EQ): How do we manage inventory to maintain both productivity and profitability?

Student teams must help their companies manage inventory of parts for the many models of basketball hoops offered by the company. Recent contracts have greatly increased the company's volume, but the increase poses inventory management problems as students, assuming the roles of inventory managers, must balance the available space in the warehouse with the delivery schedule for the finished products so the company is able to bill for shipped units without amassing expensive stockpiles of parts.

Project 4: Warehouse Design

Essential Question (EQ): How do we design the most efficient warehouse to meet the needs of a company?

Students are logistic engineers in this project and must work with their team to design the layout of a warehouse in an industrial park to meet the needs of their clients. The clients for each group are different, and these differences place specific requirements on the layout and the equipment that will be needed for efficient use of the space. Students will use their research to create models and scale drawings of a warehouse that will allow their client to maximize use of the space.

Project 5: Contingency Management

Essential Question (EQ): How can we manage potential catastrophes to ensure minimal interruptions of our logistic operations?

Acting as operations managers, students must develop a contingency plan for a regional hardware store that will allow it to run as efficiently as possible when catastrophic events threaten typical business. Students must consider issues that retailers faced in the aftermath of multiple natural disasters around the world and the impact of these disasters on businesses and the individuals who rely on the services and goods these businesses provide.

Project 6: In-Sourcing vs. Out-Sourcing

Essential Question (EQ): How can we determine whether to in-source or out-source a product or process?

Students assume the role of an operations manager who must work with the team to decide on how a grocery store will meet its customers' baked goods needs. Designer cupcakes and artisan bread are options customers have recently begun to request, and the president of the store wants a plan from the team that determines the best avenue for the store in supplying the specialty baked goods. Students will need to understand return on investment and trade-offs created by either solution as they decide whether to bake the specialty goods in-house, buy them from a supplier, or use some combination of the approaches.

Professional Notebook

Each student maintains a Professional Notebook (either an electronic or a paper version) for each project. Students take notes, define terms, develop project plans, and write reflections in their notebooks. Teachers check the notebooks periodically to evaluate understanding; to help students manage the work; and to determine the need for additional teaching, clarification, or practice.

Career Investigation

Each project contains a career component that allows students to explore careers in Global Logistics or related fields and the skills associated with success, including educational requirements.

Program Progression

The AC Global Logistics and Supply Chain Management pathway of study includes four courses of career-technical content. The first two courses set the foundation for the career field, while the final two courses allow students to practice specialized skill sets within the career field. Additional classes in mathematics, business, and language will be beneficial for students in this program. Class selection needs to reflect individual student needs and the graduation requirements of districts.

The courses are designed to be taken in order, with enduring learning concepts from each course informing the projects in the next course. The courses are described below:

Course 1: Introduction to Logistics

This foundational course consists of engaging contextual problems that introduce students to the concepts of supply chains, warehouse location, contingency planning, in-sourcing and out-sourcing decisions, and expanding existing supply chains. These concepts form the basis of global logistics and supply chain management. Students will explore these concepts to learn how professionals examine options to maximize the use of resources in establishing physical networks.

Course 2: Functional Areas in Logistics

This basic course forces students to explore deeper understandings of the concepts they discovered in the previous course as they navigate projects on warehouse design, inventory management, transportation optimization, information technology, emergency responsiveness, and the supply chain for manufacturing. Students use their experiences in this course to discover ways in which professionals minimize the outlay of resources while improving efficiency and ability in the global market.

Course 3: Global Logistics Management

This specialized course offers challenging projects that force students to look at the global implications of the industry in more detail as they experiment with decisions relating to a distribution strategy. Issues to be addressed include intermodal transportation, route selection, international shipping regulations, emergency preparedness, cultural awareness, business ethics, and international trade restrictions. Students develop their understanding of the industry in this course and truly raise their awareness of the challenges of doing business in a world with multiple borders that must be traversed.

Course 4: Logistics and Supply Chain Management

This specialized course allows students to consider the implications of all of the concepts they learned in the previous three courses as they consider environmental impact, modes for expanding existing lines, selecting business partners in a global and domestic chain, information technology, and decisions regarding e-commerce. Students explore the ongoing need to balance dependability and resource outlay in meeting customer demands around the world. Projects will expand students' decision-making skills as they entertain issues related to transportation, distribution networks, and manufacturing.

Instructional Delivery Plan

AC curricula use project-based learning (PBL).Teachers introduce each project with an entry event to give students an overview of the problem and to develop interest. Subsequently, students work in teams to determine what they need to know and do to solve the problem. They develop a team calendar and a work plan to record team expectations and methods of collaboration. As students become proficient in PBL, the teams develop greater autonomy. If teachers see a need for additional technical or academic knowledge and skills for students to complete the project, they provide instruction in the form of mini-workshops for teams that are ready for the information or whole-class instruction on the topic.

Teachers using PBL serve as facilitators rather than disseminators of information to students. **Frequently, teachers answer students' questions with more questions, challenging them to think for themselves or to conduct research rather than rely on the teacher for answers**. AC Global Logistics and Supply Chain Management students may need to use tutorials or other resources to learn software rather than rely on the teacher for instruction. Self-direction is representative of the world of real work where employees in high-skill jobs integrate various skill sets to solve complex problems. This integration is why AC projects require students to use academic skills such as reading, writing, mathematics, and science to solve technical or career-related problems. Students will also be able to work with other teachers to obtain answers to academic questions and with industry experts to find project-related information.

All AC projects require each student to prepare a final written product, using formats similar to those in the career area. When students complete research, participate in learning activities, and keep good notes in a Professional Notebook, they find it easier to produce the final product. All AC projects include an oral presentation to an authentic audience of professionals from the field. Audience members provide feedback to the teams so they can perfect their solutions to the various problems.

To complete a project, students work both independently and with a team. **Individual members ensure all team members demonstrate understanding of the concepts and procedures used in solving the problem.** Students participate in the authentic presentation (stated above) as well as two other collaborative presentations for group members to learn to work together and with other groups. Collaboration will deepen learning and allow each student to produce higher-quality final products than they would have been able to do working in isolation.

Teachers frequently review the work of individuals and teams. They review Professional Notebooks weekly to monitor progress and provide suggestions to help individuals and teams focus or redirect their energies as needed. A teacher may recommend or require an extra-help session. Students expect homework and out-of-class assignments to complete projects.

Assessment Plan

AC courses include two types of assessment: formative and summative. Teachers use formative assessments to determine the need for additional instruction. Typically, teachers do not score formative assessments until students demonstrate mastery of knowledge and skills. Students use formative assessments (e.g., checklists, rubrics, and peer or teacher feedback) to determine what or how to improve. Students usually redo formative assessments until the work reaches the high standards expected of AC students. Students sometimes redo work after class hours, during extra-help sessions or homework, to avoid slowing the pace of the team or the class.

Summative assessments measure how well students have mastered academic, technical, technology, and 21st-century standards at the end of an assignment, a project, or a major assessment, such as an end-of-project or an end-of-course exam. Students ordinarily do not redo summative assessments (e.g., oral presentations to authentic audiences, final products, and end-of-project or end-of-course exams). The assessment plan for the AC Global Logistics and Supply Chain Management course includes five components:

1. **Professional Notebook:** Students maintain an electronic portfolio or a written notebook for each project. The purposes are to document the investigative process and research; to develop organizational skills necessary for success in continuing education and the workplace and completing the written product at the end of the project; to write daily reflections on new insights; to practice the inquiry process for group and individual questions; and to use the notebook as a study guide. AC teachers use the notebooks as formative assessment to check for student understanding and to reteach as needed. The AC teacher supplies a rubric and a due date for the notebooks. A Professional Notebook contains the following types of work used by a student to complete a project:

    - Daily and weekly reflections
    - Essential technical vocabulary
    - Notes from technical readings, interviews, and field experiences
    - Practice mathematics problems
    - Drawings and illustrations
    - Career investigations
    - Other assignments completed during the project

2. **21st-Century Skills**—21st-century skills are the personal skills necessary to compete in a global economy that demands innovation by workers, business owners, and entrepreneurs. Competition in the modern economy requires an understanding of global awareness; financial, economic, business, and entrepreneurial literacy; and civic, health, and environmental literacy. AC courses include a variety of tools and strategies to enable students to use these skills. Teachers assess students' understanding and application of 21st-century skills by rating how they 1) use critical thinking skills in the inquiry process; 2) exercise creative thinking in solving problems; 3) work with others in collaborative settings; 4) communicate with others in the execution of their work; 5) utilize various technology applications to manage work; 6) build a professional culture in their work with others; and 7) explore the implications of their strengths to pursue various careers in the field.

3. **Project Academic and Technical Tasks –** Evaluation includes the demonstration of academic tasks, such as solving mathematics problems, applying science concepts, reading technical and academic materials, writing informative or argumentative texts, and making oral presentations to authentic audiences. Tasks in Global Logistics and Supply Chain Management projects include a blend of academic, technical, technology, and 21st-century skills. AC teachers evaluate students' demonstrations of understanding, reasons, processes, and procedures. AC students demonstrate quality, creativity, and efficiency of work resulting in solid design and performance of project deliverables.

4. **End-of-Project Exams:** Each project includes an end-of-project exam designed to assess whether or not each student mastered the academic and technical content required to complete the project. In other words, can each student actually read and comprehend the technical materials? Can each student actually do the mathematics to complete the project? Can each student demonstrate understanding of the science concepts underpinning the project? Can each student demonstrate mastery of technical content knowledge and the knowledge and skills to use the technology and software needed to complete the project? The end-of-project exam is designed to ensure that one student on the team did not do all of the reading, mathematics, and academic applications while others watched. The assessment includes multiple-choice questions, mathematics problems, science questions, and constructed-response questions that require students to write clearly for a specific audience and demonstrate the ability to respond to a specific work-related problem. AC students read technical materials and demonstrate understanding of the technical text. The exams include questions related to 21st-century skills, such as developing a work plan, researching possible solutions, and working together with peers and experts. Fifty percent of the end-of-project exam questions relate to technical and technology content; 50 percent relate to academic and 21st-century skills. Some questions overlap into both categories.

5. **End-of-Course Exam:** AC courses include a rigorous, comprehensive national end-of-course exam to assess technical, academic, and 21st-century skills. The exam is a final assessment of whether or not students have retained the understanding and skills acquired through all of the projects they have completed. It is recommended that the final exam will represent 30 percent of a student's grade; however, this is a decision each school must make. AC students should take this exam seriously, because it is expected that it will be used by some states as the basis for awarding an industry certification, an academic credit, or dual credit for high school and college.

   The end-of-course exam mirrors employer certification exams; college-readiness exams for mathematics, science, and language arts; and authentic workplace scenarios and technical questions. Approximately 50 percent of the end-of-course exam consists of items related to literacy, mathematics, and science; approximately 50 percent relates to technical knowledge applied through the course. Some exam items may address the habits of mind and behavior that are fundamental to 21st-century skills.

Grading Protocols

Project Grade: Teachers determine individual grades by assessing students' mastery of knowledge and skills based on a list of project deliverables, rubrics, scoring guides, and project exams. Three assessment components make up the project grade. The teacher calculates the grade by dividing the number of points earned by the number of points possible. The following table contains three project assessment components with the corresponding weight relative to the project grade:

Table 1. Project Grade Distribution

Project technical and academic tasks, including the final project product and written report	40%
21st-century skills assessments and the Professional Notebook	20%
End-of-project exam	40%

Six- or Nine-Weeks Grade: The teacher determines the grade for each six- or nine-week grading period by calculating grades from projects completed during the period. If required by the district, teachers create an end-of-grading period exam. Students accumulate points in each of the three assessment components from all project units completed during the grading period. The teacher divides the total accumulated points by the total number of points available during the grading period. The following table shows the five components making up the six- or nine-weeks grade and the end-of-grading period exam, along with the weight of each in relation to the grading period grade:

Table 2. Nine-Weeks Grade Distribution

Technical and academic grades from completed projects and written products	40%
21st-century skills assessments from all completed projects and the Professional Notebook	20%
End-of-project exams	40%

Final Course Grade: District policy determines the final grades for completion of the AC Global Logistics and Supply Chain Management course. Averaging the grades from each grading period might account for 70 percent of a student's final grade, and the end-of-course exam could account for 30 percent.

Recommended Advanced Career (AC) Global Logistics and Supply Chain Management Program of Study

This career area program of study is a source of information as you develop your own personal learning plan. This plan lists coursework suggested to meet the demands of high-wage, high-skill, and high-demand jobs. Your personal learning plan needs to meet high school graduation requirements as well as entrance requirements for a variety of postsecondary options, including college and work.

	Grade 9	Grade 10	Grade 11	Grade 12	Grades 13-14 Transitional Opportunities: Employment, Certification, Technical Degree (AA, AAS, or Diploma), Four-Year Degree
Language Arts	Literature and Composition	Literature and Composition	American Literature/ Composition	Advanced Composition	**Employment After High School** Cargo and Freight Agents; Tank Car, Truck, and Ship Loaders; Transportation Attendants; Freight Handlers
Mathematics	Algebra I	Geometry	Algebra II	College-Preparatory Mathematics	**Postsecondary Certificate Programs** SCPro—Supply Chain Professional; APICS CPIM—Certified in Production and Inventory Management; APICS CSCP—Certified Supply Chain Professional; SOLE CPL—Certified Professional Logistician; ASTL CTL—Certified in Transportation and Logistics
Science	Biology	Physics	Chemistry	AP Computer Course	**AA, AAS, Certificate or Diploma Programs** Logistics and Supply Chain Management—AAS; Warehousing and Distribution—TC; Procurement—AS; Supply Chain Management—AS
Social Studies	American Government / Civics	World History	U.S. History	Economics / Business / Free Enterprise	**Four-Year Degree Programs** Supply Chain Management—BBA; Logistics and Intermodal Transportation—BBA; Logistics—BAS; Supply Chain and Logistics—BS
Career-Technical	AC Global Logistics and Supply Chain Management 1: Introduction to Logistics	AC Global Logistics and Supply Chain Management 2: Functional Areas in Logistics	AC Global Logistics and Supply Chain Management 3: Global Logistics Management	AC Global Logistics and Supply Chain Management 4: Logistics and Supply Chain Management	**Careers** Freight Forwarders; Aircraft Cargo Handling Supervisors; Transportation Inspectors; Purchasing Managers; Inventory Control Managers
Academic Electives	World Language I Health and PE- ½ unit each required	World Language II	AP Statistics	Information Systems	
Support	Half-Semester Mathematics and English/Language Arts Catch-Up Courses* Half-Semester Course on Exploring Careers and Educational Options			SREB College Readiness Courses: Transitioning to College and Careers (Mathematics Ready: Ready for college-level mathematics; Literacy Ready: Ready for reading in all disciplines) if needed**	

* For students entering grade nine at less than grade-level proficiency in mathematics and/or English/language arts

** For students in grade 12 not yet college- or career-ready in mathematics and/or literacy