

Professional Education Course Catalog

The below listed courses have all been successfully delivered in a traditional classroom environment on several occasions to working professionals whose backgrounds span the construction, design, technical, legal, and contracting professions. Many have also been delivered in different form to executives of public agencies, consulting firms and construction companies. ACES coursework springs from the ten bodies of knowledge shown in Table 1.

Table 1: Body of Knowledge Coding Structure

Body of Knowledge	Course Code	Body of Knowledge	Course Code
Asset Management	AM	Project Administration	PA
Complex Project Management	CM	Project Controls	PC
Contracts & Procurement	CP	Project Delivery Methods	PD
Design Administration	DA	Planning & Scheduling	PS
Estimating	ES	Risk Management	RM

The courses listed in Table 2 are all ones where the content has been fully developed. The operating principle of the courses is the separation of passive learning and active learning where the lecture-type delivery of information is delivered on-line in an asynchronous format that allows the student to view that content at their convenience. All on-line content includes a short examination to verify that the student adequately understood the content. Active learning then occurs in three media.

First is self-guided practical exercises that are furnished with the on-line content to permit the student to apply the newly learned information to an actual problem or situation. These are usually short math-based problems, case study analyses, or development of typical project management documents depending on the topic.

Live synchronous webinars are then offered where an instructor will walk through the solution to the problem or facilitate a discussion of the topic. Webinars are also used to deliver material that requires discussion and analysis such as case study exercises.

Face-to-face sessions are used for increased student-instructor interactivity and to conduct larger scale practical exercise. For example, the negotiation course (PA02) can be structured to include a live mock negotiation or the cost engineering class (ES05) can include the actual review of a consultant's project estimate.

Every course in Table 2 can and eventually will be developed into a delivery format with on-line passive learning content. By the same token, every course can also be delivered by qualified instruction in the traditional classroom environment.

The courses are rated as basic, advanced, and expert with the expectation that an entry-level student would take the basic course before moving onto an advanced course. Professionals with significant experience may choose to start at the advanced level. The expert level

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Construction Engineering and Project Management is our focus*

courses a keenly focused on specific topics that are not generally of great utility to a general practitioner. Nevertheless, they do furnish an opportunity to gain tools and techniques that are not available from other training sources including university post-graduate programs.

Lastly, ACES has more available content than what is listed in Table 2 and the capability generate professional education and training in nearly any topic the client would require. Additionally, it is possible to customize the content for the specific client, using its own forms, formats, policies, etc., which allows it to build an archive of training content that can be used for new hires of all levels to quickly bring them up to speed with the company's business practices and create long-term continuity, as well as the transfer of institutional knowledge.

Table 2: Course Catalog

KEY- Level: B = basic; A = Advanced; E = Expert; Media: OL = On-Line; WB = Webinar; F2F = Face-to Face 1 – Available through ASCE Guided On-line Program; 2 – Currently available in on-line format; 3 – Programmed to be developed in on-line format; 4 – Can be put in on-line format if demand exists								
No.	Title	Content	Level			Current Delivery Media		
			B	A	E	OL	WB	F2F
AM01	Principles of Asset Management	Asset management fundamentals per FHWA standards for DOT Total Asset Management Plans	x			4	x	x
AM02	Asset Management Decision Theory	Asset condition quantification, asset valuation, prioritization techniques		x		4		x
AM03	Social Return on Investment Analysis	Valuation of non-financial costs and benefits to the economy, environment and society		x		4		x
CM01	5-Dimensional PM	Introduction to complex project management principles and methods.	x			3	x	x
CM02	Complexity Mapping	Developing relative values for project complexity based on critical success factors		x		3	x	x
CM03	Project Action Plans	Managing complexity by actively addressing specific elements by resource allocation		x		3	x	x
CM04	Finance/Cost Gap Analysis	Methodologies for controlling the complex project's cashflow to match its technical requirements over time.			x	3		x
CP01	Principles of Construction Contracts	Basic design/construction contract principles in the context of US contract law	x			1	x	x
CP02	Developing CMR & DB RFQs	Identifying critical elements of qualifications and past performance; writing the RFQ to ensure those elements are presented in SOQs		x		2	x	x
CP03	Developing CMR & DB RFPs	Focus on the technical schedule and cost elements of the RFP		x		2	x	x
CP04	Developing CMR & DB Evaluation/Selection & Award Plans	Developing fair, equitable, and defensible evaluation and selection plans for CMR and DB projects.			x	3	x	x
CP05	Preconstruction Services	Detailed look at the various preconstruction services that can be offered by the contractor in CMR & DB projects and how to incorporate them in the solicitation.				3		x
DA01	Design-Build Design Administration	Focus on controlling scope creep and establishing systems to design to budget; design work breakdown structure.		x		3	x	x

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			B	A	E	OL	WB	F2F
DA02	CM-at-Risk Design Administration	Focus on optimizing the project design to contractor means and methods to maximize constructability		x		3	x	x
DA02	Developing Performance Criteria & Specifications	A rigorous approach to diagramming essential elements of performance criteria and specs as the basis for writing them.		x		3	x	x
ES01	Quantity Take-off – Structures	Fundamentals of QTO for vertical projects	x			1	x	
ES02	Quantity Take-off – Civil/Utilities	Fundamentals of QTO for horizontal projects	x			1	x	
ES03	Pricing and Bidding – Lump Sum Jobs	Pricing and bidding strategies on lump sum contracts – direct, indirect costs and profit	x			1	x	
ES04	Pricing and Bidding – Unit Price Jobs	Pricing and bidding strategies on unit price contracts; building a UP; unbalancing;	x			1	x	
ES05	Principles of Cost Engineering	Project cost scoping and cost breakdown structure development; review of outside estimates from consultants, etc.	x			3	x	x
ES06	Top-Down Estimating	Data-driven approaches to estimating project costs at the earliest phase of development			x	4		x
ES07	Conceptual Estimating	Estimating construction costs during design		x		3	x	x
ES08	Parametric Estimating	Estimating quantities and costs based on data-driven cost estimating relationships		x		3		x
ES09	Developing and Negotiating Guaranteed Maximum Prices (GMP)	In depth coverage of GMP components and contingency pool development and management during preconstruction for CMR and Progressive DB delivery			x	4		x
ES10	Estimating and Negotiating design fees	Design WBS-based level of effort estimation; data-driven hours estimates; negotiation strategy development		x		4	x	x
PA01	Developing Proposals	Principles of proposal writing and presentations of proposals	x			1	x	
PA02	Principles of Contract Negotiation	Fundamentals principles of developing and executing a negotiation strategy	x			1	x	
PA03	Quality Management	Fundamentals of quality control and assurance from the project engineer's perspective	x			1	x	
PA04	Safety Management	Basic project safety planning; design for safety principles (NOT an OSHA course)	x			1	x	
PC01	Earned Value Management	Classic cashflow and labor hour analyses to calculate project performance metrics during project execution	x			3	x	x
PD01	Project Delivery Methods	Intro to alternative project delivery	x			2	x	
PD02	CM-at-Risk/CMGC	Detailed discussion of CMR		x		3	x	x
PD03	Design-Build	Detailed discussion of CMR		x		2	x	x
PS01	Principles of Critical Path Method (CPM) Scheduling	Fundamentals of CPM schedule development; sequence of work, float, etc.	x			1	x	

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PS02	Principles of Linear Scheduling Method (LSM)	Fundamentals of LSM schedule development; sequence of work, production-based controls, etc.		x		3	x	x
PS03	Converting LSM to CPM	Method for displaying LSM output in CPM format to satisfy owner specs.			x	4		x
PS03	Forensic Schedule Analysis	Methods for comparing as-planned to as-built schedules to determine impact.		x		4		x
PS04	Stochastic Life Cycle Analyses	Applying simulations and analytics to the early feasibility studies to estimate expected costs and time requirements.		x		4	x	x
RM01	Intro to Risk Management	Risk theory, risk register development	x			2	x	x
RM02	Risk Contingency Development	Use of stochastic simulations to develop rational line-item contingencies		x		3	x	x
RM03	Stochastic Risk Analysis	Data-driven analysis of expected cost and time using curve-fitting techniques and simulations.			x	3	x	x
RM04	Managing Utility Risk	Tools for managing utility risk during planning design and construction			x	4		x
RM05	Managing Geotechnical Risk	Tools for managing geotechnical risk during planning design and construction			x	4		x