

## APPENDIX C

## SUPPLEMENTARY EDUCATION

Supplementary Education. Suggested sources of supplementary education include, but are not limited to, the following:

a. AIA "SupEdGuides" and AIA-approved professional development programs available from the Education Services Center, The American Institute of Architects, 1735 New York Avenue, N.W., Washington, DC 20006. SupEdGuides are self-study resources designed to meet interns' special needs and interests. The SupEdGuides focus on topics pertinent to architectural practice, and each guide presents fundamental issues, asks probing questions, and suggests ways to develop analytical skills and make design and management decisions.

b. USACE Proponent Sponsored Engineer Corps Training (PROSPECT) Program and PROSPECT Exportable Training Program courses including, but are not limited to, the following:

(1) Advanced Construction Contract Administration. This is a new course which replaces the "Advanced Construction Management" course. This course will increase the effectiveness of the student by developing a keener insight into the problems created by the ever-changing methods and procedures utilized in construction contracts and management.

(2) Aesthetic Resources: Identification, Analysis, and Evaluation. This course will provide the student with an in-depth working knowledge of the current policies, procedures, and acceptable methods for assessment and evaluation of the impact that projects may have on the aesthetic quality of the urban and rural environments.

(3) Architect-Engineer Contracting Procedures and Negotiations. This course will provide the student with a working knowledge of applicable laws and regulations governing AE contracts, and provides a concentrated look at all aspects of AE contracting from project authorization, through selection, negotiation and contract award, to contract close-out.

(4) Architectural Concrete. This course provides the student with the specific knowledge required to assure the quality design and construction of architectural concrete.

(5) Architectural Hardware Quality Verification. This course will develop new skills oriented to the quality verification (inspection) of hardware used in building construction and will update the student's knowledge of current industry practices and standards, including changes in hardware specifications.

(6) Architectural Hardware Specifications. This course is designed to develop skills oriented to specifying or approving builder's hardware used in building construction, to update the student's knowledge of current industry practices and changes in specifications, to relate the problems involved in scheduling hardware, and to provide training that will result in a more effective quality assurance team.

(7) Automatic Fire Extinguishing Systems. This course provides basic knowledge and skills necessary for the design, calculation, and review of automatic fire extinguishing systems, i.e., sprinklers (water spray and foam water), dry chemical, CO , and Halon.

(8) Comprehensive (Master) Planning. This course will provide the student with an overview of the comprehensive planning process and a general guide to prepare comprehensive plans. Material covered includes definitions of comprehensive planning, organization needed to prepare comprehensive plans, benefits of planning, consequences of not planning, planning environments, the relationship to surrounding communities, and the principles of planning.

(9) Computer-Aided Cost Estimating System (CACES) Course. This course will provide students with instructions to prepare and execute a cost estimate using CACES in accordance with ER 415-345-42, Construction Cost Estimating and Reserve for Contingencies.

(10) Computer-Aided Design for Buildings. This course will introduce students to computerized methods of structural design and analysis of buildings. Practical applications of computerized techniques will be demonstrated through the use of a 2-D frame analysis program (CFRAME), a 3-D Building Systems Analysis Program (CTABS80), and the General Purpose (STRUDL) Structures Computer Program.

(11) Concrete I - Quality Verification. This is a PROSPECT Exportable Training package that will provide the student with the technical knowledge, both theoretical and practical, to inspect concrete construction with a degree of competency that assures quality construction.

(12) Concrete Materials. This course will instruct the student on all aspects of advanced concrete materials technology.

(13) Concrete I - Quality Verification. This course will provide the student with the specific knowledge of materials, techniques, and procedures for inspecting on-site concrete construction.

(14) Construction Contract Administration. This is a new course which replaces the "Introduction to Construction Contract Management" course. The course will assist the student in translating academic knowledge to competent application in the construction setting. Additionally, it will provide the student with an overview of USACE operations with an emphasis placed on construction contract management.

(15) Construction Contract Engineering With Microcomputer-Aided Cost Estimating System (M-CACES). This course provides the student with instruction and ready-reference material to assist in improving his/her ability to follow USACE policies and procedures for preparing Government estimates for construction projects.

(16 ) Construction Quality Management. This course is designed to educate the student on the objective of construction quality management related to establishing quality requirements, controlling quality during construction, and taking necessary measures to assure quality. This course will also provide the student with the opportunity to discuss problems associated with the implementation of the quality control and assurance system.

(17) Construction Quality Management. This is a PROSPECT Exportable Training package with provides the student with construction quality management policies, requirements, and procedures.

(18) Contracting Overview. This is a PROSPECT Exportable Training package that is intended to educate the student with a focus on contracting concepts rather than execution. It will provide the student with a basic understanding of the contracting system emphasizing what is involved and why things are done, not how they are done. This course is a prerequisite for taking courses in the curriculum of the PROSPECT Construction Contract Administration Training Program.

(19) Design Quality Management, Military Projects, Procedures and Feedback. This course will present a practical approach toward improving design reviews and will support the student in understanding the design review process. Policies, principles, procedures, and various techniques used in reviewing designs and cross-checking drawings and specifications will be covered.

(20) Electrical Quality Verification. This course will provide the student with the requirements and techniques of electrical quality verification (inspection) in order to

assure compliance with construction contract requirements. It also will provide the student with an increased knowledge of electrical materials, equipment, installation, and inspection techniques. The student will receive additional training in the interpretation of electrical plans and specifications, and the National Electric Code.

(21) Electrical Quality Verification. This is a PROSPECT Exportable Training package that trains students with limited experience or knowledge in USACE requirements in order to assure compliance with electrical requirements of the construction contract. Additionally, it introduces students to electrical terminology, materials, equipment, installation, and inspection techniques.

(22) Energy Conservation Design for New Buildings. This course will provide the student with detailed treatment of design and analysis techniques to ensure an energy conscious, cost-effective design for new buildings. Additionally, this course will aid students in implementing all new and existing conservation criteria.

(23) Energy Conservation in Existing Buildings. This course will provide students with a capability to select, analyze, evaluate, and design energy conserving measures for implementing energy reduction programs in existing buildings. Additionally, this course will aid students in implementing all new and existing conservation criteria.

(24) Environmental Impact Assessment of Projects. This course will provide the student with a working knowledge of the environmental assessment process and the procedures to follow in preparing an environmental impact assessment document or an environmental impact statement.

(25) Environmental Laws and Regulations. This course will provide the student with the ability to list major federal statutes designed to protect the environment, summarize the major provisions of each federal environmental law and the relationship to USACE projects, and identify and understand the legal requirements for environmental protection as related to specific projects.

(26) Estimating for Construction Modifications. This course will provide the student with instructions and ready-reference material to assist in improving his/her ability to prepare an estimate for a construction contract modification in accordance with USACE policies and procedures.

(27) General Construction Quality Verification. This course provides the student with the basic technical knowledge required for the quality verification (inspection) of all elements of building construction. The course is based on guide

specifications (CEGS) and identifies the quality assurance representative's (construction inspector's) role as it relates to construction quality management.

(28) Human Resource Management I, II, III, and IV. These courses develop and refresh human resource (personnel) management skills of the student which are vital in design team leadership, management, and supervisory roles of the professional architect.

(29) Interior Design and Administration. This course will inform the student of current interior design policies, responsibilities, operating procedures, and criteria. It provides procedures and techniques necessary to effectively implement and manage interior design from initial planning through furniture installation. The course defines the overall requirements for producing quality interior design and the specific tasks of various key personnel, e.g., the project manager, technical reviewer, estimator, designer, procurer, installation staff, and the using agency coordinator.

(30) Masonry Structures Design. This course will reinforce the student's knowledge in design and construction practices including criteria, procedures, and specifications for masonry structures. In addition to covering techniques of masonry structural design, the course also covers seismic design for masonry buildings.

(31) Mechanical I - Quality Verification. This course will provide the student with information, procedures, and problem area solutions that must be known to effectively perform mechanical engineering quality assurance duties. The course specifically addresses preparatory, initial, follow-up, and final inspection techniques concerning mechanical equipment, materials, and testing requirements common to most building construction.

(32) Mechanical Quality Verification. This is a PROSPECT Exportable Training package that provides the student with a basic knowledge of the fundamentals of mechanical systems inspection. Additionally, it acquaints the student with mechanical engineering guide specifications (CEGS), repetitive design and construction deficiencies, and inspection materials and procedures.

(33) Military Construction Project Management. This course will provide the student with the management procedures, tools, and techniques necessary to effectively manage projects from design authorization through construction completion.

(34) National Electric Code (NEC). This course, though designed for electrical engineers, will increase the intern's understanding and abilities concerning the design of interior electrical systems which meet the requirements of the NEC.

(35) Negotiating Construction Modifications. This is a new course that replaces the "Construction Contract Negotiating" course. The course will provide instruction concerning policies and procedures that will provide the student with knowledge in negotiating construction contract modifications. It will also provide practice in effectively analyzing all changes in connection with contractors' proposals and Government estimates.

(36) Paint Quality Verification. This course is designed to reduce painting deficiencies by providing the student with quality verification (inspection) techniques and the basic concepts of paint composition, coating selection, safety, and the construction quality management necessary to administer the painting requirements of the construction drawings and specifications.

(37) Roofing Technology. This course will provide the student with an advanced understanding of roofing techniques which can be applied during design, constructibility reviews, technical reviews of roofing submittals, reviews of plans and schedules of roofing applications, testing and inspection during roofing applications, and during maintenance and repair activities on existing roofs.

(38) Security Engineering. This course will provide the student with an introduction to the security engineering design process. The course provides the methodology leading to the determination of protective measures for a facility against terrorists and other peacetime threats. The course also includes guidelines, specifications, standards, and building hardening information to aid in this process.

(39) Seismic Design for Buildings. This course will train students who are not thoroughly familiar with seismic design.

(40) Solar Active Energy System Design. This course is designed to provide the student with an introduction to solar energy use in buildings and the processes to address detailed treatment of active solar energy systems design and installation for heating, hot water, and cooling.

(41) Solar Energy Systems Quality Verification. This course will provide the student with information, procedures, problem areas, and a familiarity with solar energy systems in order that he/she might effectively perform quality verification (inspection) duties during, and at the end of, building construction. The course provides a detailed description of active solar energy systems and proper installation procedures to assure high performance and reliability.

(42) Solar Passive Energy Design for Buildings. This course will provide the student with an introduction to passive and hybrid solar energy use in buildings and acquaint him/her with the principles of integrating passive design into standard architectural practice.

(43) Specification Writing for Construction Contracts. This course will provide the student with instruction concerning the preparation of effective specifications for construction projects. The course covers basic principles of specification writing, procedures, and techniques as well as the relationship of the specifications to the construction drawings and other elements of the construction system.

(44) Structural Engineering Civil Works Design Criteria. This course reviews the latest civil works structural design criteria and provides training in its use.

(45) Structural Engineering Military Design Criteria and Applications. This course reviews the latest structural design criteria governing military construction and provides training in its use.

(46) Urban Environment. This course provides the student with a broad spectrum of awareness concerning the environmental factors that have a direct and indirect affect on USACE projects in urban areas.

(47) Value Engineering Workshop. This course will provide the student with the requirements, policies, and procedures necessary to recognize areas of potential for value engineering (VE) studies that will enable him/her to perform effectively as a value engineering study team member.

(48) Water Supply Design and Rehabilitation. This course will familiarize the student with analytical techniques needed to develop facility designs and make cost estimates for planning studies, analyze water distribution systems, and analyze the economics of rehabilitating or replacing systems.