EDP AUDIT CAREER PATHS

BY

FREDERICK GALLEGOS

GAO EVALUATOR - Los Angeles Regional Office
U.S. General Accounting Office
EDP Auditing in the Federal Environment—Cont.

EDP AUDIT CAREER PATHS
Monday, June 22, 10:15 to 11:30 a.m.
or
Tuesday, June 23, 10:15 to 11:30 a.m.

Frederick Gallegos, Supervisory Management Analyst, General Accounting Office.

This presentation will focus on the training and career paths for the EDP auditor. Mr. Gallegos will discuss recent training and career development programs both within and outside of the General Accounting Office. Consideration will be given to the how an organization can design and develop its own career development program. What needs to be done? How to start? How to obtain support? Specific approaches for the identification of skill levels, selection of training programs and the conceptualization and formalization of a training/career development program will be covered.

Mr. Gallegos’ primary function within the General Accounting Office is to research program and agency policies, audit management operations and report to interested members of Congress. He assisted in the design, development and implementation of an agency-wide data processing training program. Gallegos was a prime mover in the development and implementation of an M.S. program in EDP Auditing at California Polytechnic University at Pomona.

IMPLEMENTATION OF A/71 GUIDELINES FOR FEDERAL SYSTEMS
Tuesday, June 23, 4:30 to 5:30 p.m.
Panel Discussion

This panel discussion will review the requirements necessary to prepare to meet the needs of A/71.
The panel will consist of:
Peter Browne, Computer Resource Controls Joseph Sickon, U.S. Department of Housing and Urban Development

Participants of the conference are invited to present their views and bring questions to the panel.

ORGANIZING AND MANAGING THE EDP AUDIT FUNCTION IN A FEDERAL DEPARTMENT
Wednesday, June 24, 10:15 to 11:30 a.m.
Joseph A. Sickon, Assistant Inspector General, U.S. Department of Housing and Urban Development

This session describes computer auditing in a major Federal Department. Mr. Sickon addresses organization and staffing of the EDP audit function along with planning, reporting and following up on audit findings. He also discusses the impact of the Inspector General Act of 1978 and compliance with GAO Audit Standards and OMB Circulars.

Sickon is responsible for planning, conducting, supervising and coordinating audit activities related to programs and operations of the Department. He supervises audit and related efforts of about 350 audit and clerical personnel in headquarters and in the field.

A former Director of Procurement and ADP Management with the U.S. Department of Commerce, Mr. Sickon also served as Director of Audits for that Department, following a number of years in the audit and financial management of the Maritime Administration, Department of Commerce.
TRAINING AND CAREER DEVELOPMENT FOR

THE EDP AUDITOR

** OUTLOOK
** CAREER PATHS FOR THE EDP AUDITOR
** IDENTIFICATION OF SKILL LEVELS
** TRAINING AND CAREER DEVELOPMENT PLAN
** SELECTION CRITERIA FOR TRAINING COURSES
OUTLOOK
Although the basic concepts of EDP Auditing have been around since the 1960's and several authorities will even say the 1950's, EDP Auditing as a profession has come into its own in the 1970's. Moreover, if one checks the want ads of most newspapers or even the business classified ads they will see with more regularity, advertisements for EDP Auditors, Internal Auditors with EDP audit experience or Accountants with EDP knowledge and qualifications. The EDP Auditor's demand has grown quite rapidly over the last 4-6 years, especially with reported financial fiascos such as Equity Funding, the Rifkin incidence, the legal issues such as Foreign Corrupt Practices Act and the pending Computer Security Protection Act. With the average loss due to abuse or crime running about $460,000 to $780,000, private industry and government have awakened to the reality that the computer is their soft underbelly. If they are shaking now, what about tomorrow? Who will the EDP Auditor be? What training and credentials will he need?

WHERE IS EDP AUDITING GOING

In general, we are in a Technology Evolution phase in the computer field. It has been said by many of the authorities in the field that during the 1980's and 1990's we will have to undergo a revolution in our way of thinking and attacking EDP problems. The EDP Auditor of today will be tomorrow's Information Systems Auditor. Today's EDP auditors, especially those with international organizations, are feeling the pinch of this future technology. Approaching the audits of distributed processing environments, data base architecture, networks, minicomputers, micro-computers and processors are unlike the traditional installation reviews of yesterday. How does one approach an audit of today's advanced system which may involve one or more combinations of the following: telecommunication, teleprocessing, distributed processing, OCR input, microtechnology, etc. Many are struggling now to answer these questions or attempt to find some explanatory method to approach a solution.

The future technology of the 1980's and 1990's point toward advancements in hardware and software beyond our comprehension. The Computerworld issue of December 31, 1979 presented a range of articles surveying the future. Even in retrospect, the issue cites "The machines of the '70's become antiques of the '80's. They grow bigger, more powerful; we, in proportion, feel smaller. We question their limits--and ours." The Information Systems Auditor of the '80's and '90's will test those limits in ways we today do not think possible or achievable.

In short, the EDP Auditing skills needed by the year 2000 may require extensive knowledge in the following areas:

- Telecommunications
- Teleprocessing
- Microcircuitry
- Firmware
- Embedded systems technology
- Laws involving
  - Privacy
  - Security and Fraud
  - Interstate data transfer
  - International data transfer
Although some people may laugh, we are only a few years away from the first on-line, real-time financial information system. The developments in the fields of telecommunication and teleprocessing will shrink the communication barrier by a factor of 100 within the next 9-10 years. In recent discussion with several fellow EDP auditors in the banking industry, I was not surprised to hear that their organization's ultimate goal is to have a real-time financial information system. In other words, if a transaction occurs in a California subsidiary, it will immediately appear on the financial books of the New York holding company. Internationally, if it occurs in a Switzerland subsidiary it will immediately appear on the financial account records.

Telecommunications and teleprocessing involve a host of subtopics which the Information Systems Auditor must be able to adequately and capably review. Further, examination of the controls in such system will require a high level of technical expertise. Knowledge of telemetry transfer of data, crytographics and telecommunication and teleprocessing security will gain increasing importance.

Firmware, Microcircuitry and Embedded Technology

Another area of virtual technology explosion is in the new firmware, microcircuitry and embedded technology that has recently entered the business community. Although such technology is no stranger to advanced weapons systems technology, its applicability to business/information systems community is just now being felt. We are seeing an evolution of new systems technology that can be self-contained or shared in a distributed architecture. The orientation of such systems is toward a total integrated information system designed to tie information channels together.

Again, the challenges from these advancements are coming forth. The Information Systems Auditor must have the knowledge and skills to conduct audits or examination of the firmware and microcircuitry and insure that the information processing that takes place yields valid, reliable and secured information for management decision making. Arthur Young & Company has recently published a brochure on Computer Auditing which characterizes an audit in the year 2001 with the aid of embedded technology. Although they have stated that article is fictitious, they do indicate that with the changes that have occurred and those foreseen in Computer Technology, the concepts are not far from reality or out of the question in the year 2001.

Legal Requirements

If you think the information systems auditor has his hands full with the two prior areas discussed, the legal requirements which have and will be evolving over the next twenty years will have tremendous repercussions in the field. Again, one must take a look to what is happening in Europe and their concern for information privacy and security. Luxemburg, Austria and West Germany see computerized data as a potential weapon in the hands of a wrong person. Therefore, they have enacted strong laws to ensure that individual data and the access to the dissemination of is controlled and protection guaranteed.

The Privacy Act of 1974, Foreign Corrupt Practices Act of 1977, and the pending Federal Computer Security Protection Act are stepping stones to more comprehensive legislation. The information systems auditor will need to clearly understand these laws and apply them in his evaluations of automated systems. Legal implications and restriction on intra-and inter-state transfer of information booms in the future.
WHAT STEPS ARE BEING TAKEN NOW TO TRAIN THE IS AUDITOR

The total awareness of the skills needed to develop a capable information systems auditor of the future are largely undefined at this time. Our society has approached this need in a fragmented order. Several steps in assessing these skills have been undertaken by various professional societies, educational institutions, government agencies and Big "8" Audit Firms. These efforts have been largely fragmented and lacking in coordination and cohesiveness. There results have been very good in some areas considering the above and extremely weak in other areas.

Professional Societies

Among the professional societies who have contributed to the advancement and awareness of the EDP Audit role in the organization are the American Institute of Certified Public Accountants, Institute of Internal Auditors and the EDP Auditor's Association and the EDP Auditor's Foundation for Education and Research.
CAREER PATHS FOR THE EDP AUDITOR
IDENTIFICATION OF SKILL LEVELS
CREATING AN INFORMATION SHARING NETWORK FOR THE EDP AUDITORS OF THE EIGHTIES

Forum on EDP audit professional
Forum on EDP audit Research Projects
Forum on Personal Growth and the Human Potential
Model on Academic Offerings and Training goals in EDP auditing
Forum on Structuring, Indexing, and Integrating the Growing Common Body of Knowledge
Information Resources Forum
Training Resources Forum
Need-to-Know, Training Needs Forum
Forum on Teamwork with Financial auditors, EDP Security, Quality Assurance, Data Control, External Auditors
Forum on EDP audit, Control, and Security Interests of Peer Professions and Peer Groups
Forum on EDP audit interests and responsibilities of computer users
Forum on EDP audit interests and responsibilities of auditees

• ISSUES, PROBLEMS
• SOLUTIONS, VALUES
• NEED TO KNOW
• TRAINING NEEDS
• SOURCES OF INFORMATION
• SOURCES OF TRAINING
• EXPERTS
• CLIPPINGS, ARTICLES, BOOKS

Audit Activities Forum
Audit Target Areas Forum
Forum on Staffing and Running the EDP Audit Department
Risk Assessment Forum
Controls Forum
Auditability Forum
EDP Security Forum
EDP Privacy Forum
Forum on Methods, Tools, and Practices
Audit Communications Forum
Need to Know, Training NEEDS Forum
Technology Awareness Forum
Control Issues surrounding New Technology
OUTLINE

COMMON BODY OF KNOWLEDGE
NEEDED TO AUDIT COMPUTER SECURITY

1. COMPUTER SYSTEMS, OPERATIONS, AND SOFTWARE
   A. Theory of systems (as applied to information systems)
   B. Theory of computers
   C. Theory of data communications

2. DATA PROCESSING TECHNIQUES
   A. Information structures
   B. Programming languages
   C. Sort and search techniques
   D. File creation, maintenance, and interrogation
   E. Storage devices
   F. Data management systems
   G. Integrated systems
   H. The dynamics of developing, modifying, and maintaining computer software

3. MANAGEMENT OF THE DATA PROCESSING FUNCTION
   A. Organizational structures
   B. Personnel selection, training, and management
   C. Operating and organizational policies and procedures
   D. Computer operations
   E. Analysis, design, and programming functions

4. SECURITY OF THE DATA PROCESSING FUNCTION
   A. The computer center
   B. Remote sites
   C. Systems including operating, application, and telecommunications software
   D. Policies and procedures
   E. Personnel
   F. Data handling
   G. Recovery capabilities
   H. Tests of internal controls

5. RISK ANALYSIS AND THREAT ASSESSMENT
   A. Physical facilities
   B. Remote sites
   C. Software
   D. Information

6. MANAGEMENT CONCEPTS AND PRACTICES
   A. Management tasks, responsibilities, practices, and ethics
   B. Business administration
   C. Principles of organizational structures
   D. Concepts of general management
   E. Management of the human resource

4-11
7. AUDITING CONCEPTS AND PRACTICES
A. Introductory accounting
B. Intermediate accounting
C. Advanced accounting
D. Cost accounting
E. Municipal and governmental accounting
F. Auditing

8. ADDITIONAL QUALIFICATIONS NEEDED TO AUDIT COMPUTER SECURITY

Individuals selected to conduct audits of computer security, in addition to the common body of knowledge outlined above, should have the following qualifications:

1. Sufficient experience to be able to plan, direct, and coordinate audits of large complex functions, activities, or programs,
2. The ability to assign tasks to individuals on the team and to identify the specific disciplines and expertise needed to perform the work, and
3. The ability to conduct conferences and to prepare, present, and process the report describing the results of the work.
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| S = Skills concepts, practices, plus specialized ability to perform | p = Practices, advanced concepts plus knowledge of actual performance and skills | C = Concepts, generalized knowledge |

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<tr>
<th>ADP System</th>
<th>ADP and/or acquisition of</th>
<th>Government-wide impact</th>
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<th>Application Requirements</th>
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TRAINING AND CAREER DEVELOPMENT PLAN
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<th>Course Title</th>
<th>Advanced Grades 14/15</th>
<th>Project Leader Grades 13/14</th>
<th>Sub-Project Leader Grades 12/13</th>
<th>Intermediate Grades 11</th>
<th>Entry-Level Grades 5/9</th>
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<tr>
<td>Advanced Supervision</td>
<td>Advanced Program Evaluation</td>
<td>Auditing Tele-communications</td>
<td>Auditing Data Base Management Systems</td>
<td>Conducting Program Results Reviews</td>
<td>Entry Level Orientation</td>
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<td>Project Environments, Data Base Management Systems</td>
<td>Producing Organized Writing &amp; Effective Reviewing</td>
<td>Advanced ADP Concepts</td>
<td>Intro to Computer Performance Evaluation</td>
<td>Intermediate Level Writing</td>
<td>Base Level ADP-1</td>
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<td>Project Environments, Data Base Management Systems</td>
<td>Conducting Program Results Reviews</td>
<td>Computer Assisted Audit Techniques II</td>
<td>Systems Analysis</td>
<td>ADP Management and Operations</td>
<td>Intro to SPSS &amp; S.A.S.</td>
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<td>Effective Concepts</td>
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COMPUTER SECURITY AND PRIVACY

OBJECTIVES: To expose the individual to legal, political and public policy aspects of privacy and security within computerized systems, and to present a framework on which the participants can build upon to ensure that necessary safeguards exist in computerized systems.

CONTENT: The course is divided into 8 basic learning elements as follows:

- History of information systems privacy,
- Legal environment,
- Civil liberties,
- Total system security,
- Environment security,
- Installation security,
- Software security, and
- Cost/benefit analysis.

METODOLOGY: Classroom instruction, group discussion, group exercise.

LENGTH: A 3 day program.

INSTRUCTORS: Office of Personnel Management (OPM).

PRE-REQUISITES: Base level ADP I & II or equivalent knowledge.

RECOMMENDED PARTICIPANTS: ADP Auditors and Computer Specialist/OPS Research

FREQUENCY: Offered 4 times a year.

CLASS SIZE: 20-24 students.

STATUS: Available at $250 per student.
INTERNAL CONTROLS IN AUTOMATED SYSTEMS

OBJECTIVES: To provide individuals with an overall understanding of ADP internal controls which can be used to evaluate the reliability of computerized data and the adequacy of security over computerized systems.

CONTENT: The course is divided into 11 basic learning elements as follows:

- Organization Controls,
- System Development,
- Data Center Management,
- Data Center Security/Protection,
- Data Origination,
- Data Entry Preparation/Validation,
- Data Communication Controls,
- Computer Processing Controls,
- Processing Controls in Advanced Systems,
- Data Base Controls, and
- Output Processing.

METODOLOGY: Approximately 2/3 of the course time is lecture aided by slides. Numerous class exercises which require group discussions and presentations are interspersed.

LENGTH: A 5 day program.

INSTRUCTORS: GAO auditors who have extensive knowledge of ADP internal controls and job experience in auditing internal controls.

PRE-REQUISITES: Base Level ADP I & II or equivalent knowledge.

RECOMMENDED PARTICIPANTS: ADP Auditors and Computer Specialist/OPS Research

FREQUENCY: Offered twice a year.

CLASS SIZE: 12-25 students.

STATUS: Present course under revision.
COMPUTER ASSISTED AUDIT TECHNIQUES II

OBJECTIVES: To provide individuals with advanced knowledge in the use of computer retrieval packages (DYL-260 and DYL-AUDIT) and program documentation packages (DAS and DCD); and how they have been and can be applied to audit work.

CONTENT: The course is divided into 4 basic learning elements as follows:

--Advanced DYL-260 concepts and programming to include: editing, last-time logic, indexing, subroutines, linkage, fixed position printing and others,
--DYL-AUDIT discussion and use,
--DAS and DCD discussion and use, and
--Class problem using the above techniques.

METHODOLOGY: Video-assisted lecture with hands-on exercise.

LENGTH: A 5 day program.

INSTRUCTORS: Three CAO senior ADP auditors with extensive CAATS experience.

PRE-REQUISITES: All base level, and previous career ladder training, or equivalent knowledge.

RECOMMENDED PARTICIPANTS: ADP Auditors, Computer Specialist/OPS Research

FREQUENCY: Offered twice a year.

CLASS SIZE: 15-18 students.

STATUS: Under development.
III OVERVIEW OF TRAINING PROGRAM

Continuing Education

MANAGERS AND AUDIT

EXECUTIVE, SUPERVISORS, AND AUDIT MANAGERS

Current Computer Technology

Computer System Software

Computer Programming

Computer Operation & Performance

Computer Security and Privacy

ADP Acquisitions

System Design & Development

ADP Trained Data Retrieval Packages

ADP Controls & Computer Auditing

BASIC ADP Auditing

INTERMEDIATE ADP Auditing

ADVANCED ADP Auditing

GENERAL

The training program is designed to provide the specialized ADP training necessary to equip general auditors with the knowledge, skills, and professional competence needed to conduct audits in an ADP environment. The program includes the general concepts of ADP subject areas and basic and intermediate ADP topics. The training program has been developed to help the auditor keep up-to-date or to meet special needs. The auditor has had sufficient on-the-job experience, advanced courses in several subject areas, and an understanding of the computer audit process. At this point, the general auditor should be familiar with general audit controls and be able to conduct an audit of an ADP system through direct experience. The program is designed to provide the specialized ADP training necessary to equip general auditors with the knowledge, skills, and professional competence needed to conduct audits in an ADP environment.
V. ADP CONTROLS AND COMPUTER AUDITING

Provides a study of internal controls in automated systems and detailed procedures for evaluating these controls in audits of computerized systems.
For Further Information Call (301) 492-6351 or 492-6352.

§2220 Includes tuition and all course materials.

Tuition

and fees not being paid in the same semester.

The course provides audit managers with an

Objective

Any basic ABS course.

Pre-requisites

cost-benefit analyses.

Auditee

and computer-related objectives. And

Monitoring internal control objectives. And

computer security.

Certification

3 days - IAIIP

App for Audit Managers

EXECUTIVE COURSE
Appendix I

Other locations--Call appropriate number in Washington, D.C.--9350, 001 include all tuition.

The course provides fundamental knowledge, experience, and training in ADP auditing.

Objective

Any basic ADP course.

Prerequisites

--Audit techniques and their application.
--Other than real-time environment, and
--Intercast controls and audit trails in
--Point, operation, and program control.
--Computer Programming (Program development).
--Understand, and be able to audit tools.
--Logical data (Programming, understanding of).
--ADP equipment (capitalized, character).

Workshops:

--Discussions, and training, and team
are developed through lectures, group
outside of class. The following services
of classroom work and 20 hours of work.

The course includes approximately 30 hours

Description

5 days - 8PM

Tools and Techniques:

Auditing Automated Systems:
In the Office of Personnel Management, the Information System is designed and developed by the Audit System Design and Development.

To help ensure the accuracy and completeness of the audit procedure, the scope of the audit and the system are designed to meet the needs of the auditor. These courses are conducted over the system design and development to include corrective action to address any deficiencies and improve the accuracy and completeness of the audit.
SELECTION CRITERIA FOR TRAINING COURSES
SELECTION CRITERIA FOR COURSES

1. Does the course support our organization's short term goals or objectives?

2. Does the course provide new or innovative techniques which can benefit the organization?

3. TYPE OF INSTRUCTION PROVIDED IS WORTHWHILE

4. MEDIA AND ANTICIPATED LEVEL OF EFFECTIVENESS
Master of Science in Business Administration
Electronic Data Processing Auditing Option

Dr. Madeline Currie, Director, Graduate Programs
Dr. Ronald Eaves, Advisor, EDP Auditing Option

Graduate Programs Committee

Dr. Madeline Currie, Chairperson

Peter Dawson, Human Resources & Small Business Management
Ronald Eaves, Information Systems
Hyung-Ki Jin, Finance, Insurance & Real Estate
Morcos Massoud, Accounting
Charles Pinkus, Management Science & Production
Anthony Reed, Marketing Management

THE CAMPUSS

California State Polytechnic University, Pomona is located south of the San Bernardino Freeway on the eastern slope of Kellogg Hill. Cal Poly is at the hub of an important transportation network. Adjacent to the San Bernardino Freeway, the campus is 40 minutes from downtown Los Angeles. The University will be convenient for travelers on the Pomona, Foothill, Corona, and Orange Freeways.

Cal Poly is a coeducational institution with an enrollment of over 15,500. It is one of 19 campuses of the California State Universities and Colleges system. Seven departments comprise the School of Business Administration: accounting; management; information systems; finance, insurance and real estate; marketing management; and hotel and restaurant management.

ACCREDITATION

The university is accredited as a degree-granting institution by the Western Association of Schools and Colleges.
from an accredited college or university plus the GMAT score; or at least 1,050 points based on the formula: 200 times the upper division GPA (4.0 system) from an accredited college or university plus the GMAT score. In addition, a minimum GMAT score of 400 will be required for admission. Exceptions may be granted on petition of the applicant, recommendation of the Graduate Programs Committee, and approval by the school dean. Applicants with bachelor's or graduate degrees other than in business will require evaluation for the necessary equivalent courses to be taken.

2. The Dean of the School of Business Administration will notify applicants of their selection or rejection.

3. The EDP Auditing Program Advisor will serve as advisor to all selected applicants.

4. An advisory program study worksheet for guidance of the student will be prepared by the Advisor of EDP Auditing Program upon admission to the program. An official degree program will be finalized prior to the student's advancement to candidacy. It will be approved by the Director of Graduate Programs and the Dean of Graduate Studies.

5. The degree program must include a minimum of 45 quarter units. Transfer credits not exceeding thirteen quarter units completed in a graduate school of an accredited college or university may be accepted upon approval of both Director of Graduate Programs and Advisor of EDP Auditing Program.

6. A grade point average of "B" (3.0) or better must be maintained in all course work attempted to satisfy the degree requirements and in all upper division and graduate level course work attempted at this university.

7. Foreign students must have a TOEFL score of 550 or better.

**Curriculum**

Due to the technical orientation of the EDP Auditing Option, a strong background in accounting and information systems is required. Before a student can be formally admitted to the graduate program, the following courses or their equivalents must be completed:

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<th>Requirements for Admission to the Program</th>
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<td>ACC 302 Intermediate Accounting</td>
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<td>ACC 303 Intermediate Accounting</td>
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<tr>
<td>IS 314 Data Management Concepts</td>
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<td>IS 315 Systems Design</td>
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<td>ACC 419 Auditing Principles</td>
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<td>IS 433 EDP Auditing</td>
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<td><strong>Total</strong></td>
<td><strong>28</strong></td>
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</table>
Many representatives from business, industry, and government recruit annually through the University Career Planning and Placement Center. Faculty members are often of additional assistance in placing students.

If you have any questions not answered in these pages, write to:

Graduate Program Advisor - EDP Auditing
School of Business Administration
California State Polytechnic University, Pomona
3801 West Temple Avenue
Pomona, California 91768

or phone (714) 598-4214 for an appointment.
GBA 659  Seminar in Current Accounting Theory (4)
Evolution of accounting theory. Current problems, reasons, and causes for controversy, and future
developments. Seminar, 4 hours. Prerequisite: GBA 551.

GBA 671  Management Seminar (4)
The development and evaluation of alternative corporate strategies, drawing upon the functional
areas within business and the outside environmental factors which affect business. Seminar, 4 hours.
To be taken in last quarter of the MBA program. Prerequisite: GBA 561.

GBA 673  Theory of Organizations (4)
Analysis of organizations from a theoretical and structural point of view. Current research in
organization dynamics and development from a multidisciplinary perspective. Seminar 4 hours.
Prerequisite: GBA 535.

GBA 689  Accounting Research (4)
Application of selected theory concepts in model construction. The determination of changes in
reported operating results arising from changes in accounting theory. Seminar, 4 hours. Prerequisite:
GBA 564.

GBA 691  Directed Study in Business (1-4)
Independent, directed study of advanced topics in the field. Individual conferences with the
instructor.

GBA 692  Independent Study (1-4)
Individual investigation or original study to be conducted in a field of interest selected by the
student with approval of the instructor. Intensive personal research under initiative of the student
with general guidance and advice from the instructor. Seminar.

GBA 695  Business Research Project (4)
A written research project concerning a significant problem in the field of business. Prerequisite:
GBA 691 for MBA candidates. GBA 541 for MS candidates.

GBA 696  Thesis (4)
A formal thesis concerning a significant problem in the field of business. Prerequisite: GBA 691
for MBA candidates. GBA 541 for MS candidates.

GBA 699  Master's Degree Continuation (0)
Registration required in any quarter following final assignment of SP in continuing work in which
student intends to use facilities of the university. Registration permitted instead of leave of absence
when student plans to use university facilities.
Upper-division courses applicable to the master's degree will be found in the section of this catalog
describing undergraduate courses in the School of Business Administration.
BUSINESS ADMINISTRATION

- Bookkeeping and Accounting
- Business-Economics Education
- Data Processing for Teachers
- Distributive Education
- Office-Secretarial Subjects

GBA 546  Fundamentals of Financial Management (4)
Theoretical and conceptual framework for financial decision making stressing analytical and quantitative techniques. Analysis of controversial and sophisticated methods of allocating resources and raising funds both internally and externally within the corporate context. Lecture-discussion, 4 hours. Prerequisite: GBA 510.

GBA 550  Seminar in Business Education (4)
Discussion of selected areas in business education. Seminar, 4 hours. Prerequisite: GBA 540 or consent of instructor.

GBA 551  Accounting for Executive Administration (4)
Control systems, responsibility in profit planning and control, capital investment decisions, and federal income tax aspects of decisions. Lecture-discussion. 4 hours. Prerequisite: GBA 511.

GBA 560  Legal Environment of Information Systems (4)
Fundamentals and intermediate knowledge of the legal environment concerning EDP. Typical legal problems arising from the acquisition, use and control of EDP. 4 lectures. Prerequisites: GBA 530 and IS 433.

GBA 561  Seminar in Organizational Behavior (4)
Human processes employed in accomplishing work tasks and creating employee satisfaction within the organization. Group experiences whereby students test their interpersonal skills in the organizational environment. Group activities, lecture discussion, 4 hours.

GBA 563  Executive Development (4)
Analysis of the factors endemic to the successful executive and how these skills and traits can be acquired. Seminar, 4 hours. Prerequisite: GBA 561.

GBA 564  Quantitative Business Analysis (4)
Quantitative theory and techniques. Linear, integer, non-linear, and dynamic programming, transportation and assignment algorithms, replacement problems, game theory and Markov processes; introduction to computer solutions. Lecture-discussion 4 hours. To be taken during first quarter of the second year of the MBA program. Prerequisite: GBA 534.

GBA 577  Advanced EDP Auditing (4)
Hands on experience in applying EDP Auditing techniques and methods. Fundamentals of advanced concepts in EDP Auditing. 4 lectures and projects. Prerequisite: IS 433 or equivalent experience.

GBA 578  Security and Privacy of Information Systems (4)
Practical case-study approach to solving security problems peculiar to the commercial data systems environment. 4 lectures. Prerequisite: IS 433.

GBA 591  Systems Approach (4)
Analysis of business systems from a systems approach. Information gathering, analysis, design, and implementation of effective systems. Analysis and critique of alternative approaches to solution of practical management problems. Lecture-discussion, 4 hours.

GBA 610  Management Policies and Strategies Practicum (4)
Experience in the making of business policy and developing competitive strategies at the top management level. Computer-based simulation, 4-hours. This course, when combined with GBA 627 Organizational Communication or other approved writing course, may be substituted for course GBA 691 Directed Study in Business and GBA 695 Business Research Project (or GBA 696 Thesis) in the MBA core curriculum.
DPMA MODEL CURRICULUM

CIS - 12

EDP AUDITING
CIS-12 EDP AUDIT AND CONTROLS

Course Level: Senior

Prerequisite: CIS-6 Data Base Program Development and at least one Audit or Managerial level course in Accounting

Course Description: An introduction to the fundamentals of EDP Auditing. Emphasis on understanding EDP controls, the types of EDP Audits, concepts and techniques used in EDP Audits. Exposure to risk assessment and professional standards in the field of EDP Auditing.

Course Goal

To develop a basic understanding, awareness, and appreciation of the EDP Audit environment.

Course Objectives

1. To develop an understanding of the EDP Audit environment.

2. To develop an understanding of the importance of EDP controls and the effect poor controls can have within a computer based information system.

3. To develop an understanding and awareness the various kinds of audits which EDP auditors perform in conducting audits of computer based information systems and operations, (i.e., SAS-3 Reviews, Audits of Systems Development, etc.)

4. To develop an understanding and awareness of some of the fundamental and new concepts and techniques used by the EDP auditor (i.e., Extended Records, Risk Assessment)

5. To develop motivation and appreciation for good professional data processing management practices.
Course Content

1. **EDP Audit Environment and Computer Based Information Systems (10%)**
   
   Skill Level 3

A basic orientation to the EDP Audit environment and its relationship and effect on computer based information systems. Relationships between the internal audit function, the external audit function, the public accounting function, and the information systems function. EDP audit definitions. Discussion of major examples of computer abuse and their impact upon the business community at large.

2. **Information System Controls (25%)**
   
   Skill Level 3

Types of Information Systems Controls:

- Application controls
- System Development controls
- Information Processing Facility controls
- Horizontal controls vs. Vertical controls
- Preventive, Detective and Corrective controls
- Controls for security

3. **Computer Audit Techniques (30%)**
   
   Skill Level 2

The types of EDP Audits (i.e., Audits of Applications, Audits of Systems Development, Audits of Information Processing Facilities, SAS-3 Reviews). Computer Assisted Audit Techniques such as Test Decking, Integrated Test Facility, Parallel Simulation, System Control Audit Review File, Sample Audit Review File, Snapshot, Extended Records, etc. Uses of audit software to verify results (i.e., confirmation, comparison with file or physical, edit & reasonableness tests). Discussion of Advantages and Disadvantages of Computer Assisted Audit Techniques.

4. **Auditing Advanced Information Systems (20%)**
   
   Skill Level 2

Techniques used to audit advanced systems which utilize a combination of any one of the following information processing techniques: on-line, real-time, teleprocessing, telecommunication, distributed processing, minicomputer,
microcomputer, data bases, etc. Techniques used to audit data base systems. Cost of Advanced Controls. Audit technical expertise needed. Examination of minicomputer and microcomputer applications and environment.

5. Systems Approach to Auditing (15%)
   Skill Level 3

Concept and Application of Risk Assessment. Concept and Application of Threat Analysis. Concept and Application of Cost/Benefit analysis in analyzing exposures and recommending controls.

EDP Audit Applications

There should be sufficient opportunity for limited research and moderate application of some of these concepts and practices through computer laboratory exercises, case studies and research papers. Included in the exercises should be requirement to design and develop an audit software program to verify results of a business application (General ledger system, payroll, inventory, etc.)

Course Approach

This course is a senior level elective course. As such, it will provide fundamental knowledge of the EDP Audit environment and Process. Although the course requires fundamental knowledge of accounting principles and processes and auditing concepts, they are used in the course to benefit and expand the knowledge of the future information systems specialist.

Emphasis throughout the course should be on the importance of EDP Controls, EDP Audit Reviews and their interaction with the business organization, especially the IS department. The course will cover EDP Controls and Computer Audit Techniques. The methodology used to introduce the EDP controls and Computer Audit Techniques is left to the discretion of the instructor. However, it should be representative of the current philosophy toward the examination of EDP controls and use of computer audit techniques.

There should be ample opportunity for students to accomplish two projects during the course which will aid the students' understanding of the EDP Audit environment and expand
their awareness of this field. The first project should be a research paper on an EDP Audit related topic of about 15-20 pages in length. In lieu of this, a Test Data case could be used as a substitute to provide more "hands on" projects. The second project should be a project which requires students to apply some of the concepts and fundamentals learned. Several case studies are presently available which can be used to accomplish this objective. The case study should include an exercise involving the design, development and execution of an audit retrieval language such as TREAT, CARS III, DYL-260, PEARL, MARS, STRATA, etc. If an audit retrieval language is unavailable, then COBOL could be used. If possible, "real world" projects should be used in place of case studies.

The Audits of Advanced Systems will be covered. However, because of the nature and complexity of this area, the presentation and exercises should be kept to an informative rather than a detail level. Included in the discussion of audits of on-line systems are Remote systems (Batch transactions and job entry [RJE]), Real-time systems (Inquiry, Update and Programming) and Switching systems (Electronic Funds Transfer, Distributed Systems and Networks). Also, discussion should include the techniques used to approach minicomputer and microcomputer applications.

The final area to be presented involves some of the newer methods or techniques used by auditors and consultants in evaluating the vulnerability of an information processing system to computer abuse and fraud. Two of the current techniques are Risk Assessment and Threat Analysis. Both employ systematic techniques and methodologies in their application. Another area for discussion is the use of cost/benefit analysis in determining the acceptable level of risk.

The teaching methodology for this course should include lecture, discussion, illustration and clarification of the concepts and terminology. The projects suggested are designed to expand the understanding of the EDP Audit Environment and Process, and to allow the development of a minimum level of skill in the application of EDP auditing concepts.
References:

Texts - (1) Computer Control and Audit
William C. Mair, Donald R. Wood, Keagle W. Davis

(2) EDP Auditing: Gordon Davis, Schaller, and Adams

(3) Controls and Auditing: Second Edition
W. Thomas Porter and William E. Perry

(4) Computer Control and Audit: A Total Systems Approach
John C. Burch, Jr., and Joseph L. Sandinas

Case Studies -

- Case Studies In Computer Control and Auditing - Funded by The Touche Ross Foundation (June 1978)

- Fedco Case Study - by Frederick Gallegos
  U.S. General Accounting Office, Los Angeles

Publications - EDP Audit, Control & Security Newsletter

EDP Auditor's Journal

EDP Auditor's Update

NBS Publication 500-19 "Audit and Evaluation of Computer Security"

Computer Control Objectives - 1980, EDP Auditors Foundation for Research and Education

NBS Publication 500-57 Audit and Evaluation of Computer Security II: Systems Vulnerabilities and Controls

Computer Audit Guidelines, Canadian Institute of Chartered Accountants
