

Design and Application of Arcade Machines

Course Design

Instructor : Chou, Pao-hua (周寶華)

Course Title	Design & Application of Arcade Machine (1 year)
Total Credit	3 for each semester; 6 for 1 year
Course Goals/Objectives	This 6 hour course covers the concepts and methods for the design and development of arcade machines. This course builds up a set of techniques used by industry game designers. It explains how and why things are done the way they are, featuring examples and case studies from the creators of today's successful games. A small game is designed and developed throughout the course in order to experience the entire process of game development, from designing the initial idea through to full-blown specification.
Specialty	This course focuses on concepts and methods for the design and development of arcade games. Topics include: history of games, graphics, multimedia, visualization, animation, game design, software engineering, interactive fiction, game development environments, and commercialization of game systems. Understanding the art and science of game design, the development of complex virtual reality simulations, and the evaluation of human play environments are incorporated into the course.
Course design	<ol style="list-style-type: none"> 1. Course for the first semester is for giving basic knowledge and technology of arcade games. 2. Course for the second semester is experience of arcade machine and problem solving. Teaching of writing formal technological paper is also included in teaching material. 3. Class exercises, role-playing, and small group discussions are also part of the class activities.
Recruit	<ol style="list-style-type: none"> 1. Students of Dayeh University with electronics technology.

	<ol style="list-style-type: none"> 2. Interested in arcade games. 3. Interested in animation, multimedia, and visualization 4. Interested in probability and its application 5. Interested in gaming psychology 6. Interested in reverse engineering
Related technology	<ol style="list-style-type: none"> 1. Autocad, Protel, Pcad, Orcad 2. CPLD, FPGA 3. Actel, Altera, AMD, AMI, ATMEL, Dallas, ICT, QuickLogic, Winbond, WSI, Xilinx IC technology

Design and Application of Arcade Machines (I)

Syllabus

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Week 1	<ol style="list-style-type: none">1. Introduction2. What is arcade machine?3. The structure of arcade machine.<ol style="list-style-type: none">(1) Software(2) Hardware(3) Machine
Week 2	<p>Basic Technology</p> <ol style="list-style-type: none">1. Terminology2. Principles of arcade machine3. Machine assembly
Week 3	<p>Introduction of accessories (I)</p> <ol style="list-style-type: none">1. Coin selector2. Power supply3. Chassis4. CRT5. Coin counter <p>Homework(I)</p> <ol style="list-style-type: none">1. Diagram of Coin Selector2. Diagram of Power Supply3. Diagram of Chassis
Week 4	<p>Introduction of accessories (II)</p> <ol style="list-style-type: none">1. counteract interference design2. SSR3. Timer: power -on 、 show card 、 game swift4. Meter5. multi-function card <p>Remote control turner</p> <p>Homework(II)</p> <ol style="list-style-type: none">1. Diagram of counteract interference2. Diagram of Timer
Week 5	<p>Machine assembly</p> <ol style="list-style-type: none">1. Architecture: cabinet, operation panel, score panel,

	<p>transportation wheel</p> <p>2. Circuit : PCB, chassis, power supply, coin selector, coin counter</p> <p>3. Principles of machine assembly</p> <p>Discussion of homework</p>
Week 6	<p>Repair of arcade machine</p> <p>1. Tools & instrument (1)multi-meter(2)oscilloscope(3)logical detector</p> <p>2.Repair technology</p> <p>3.Repair of IC board</p> <p>4.FAQ</p>
Week 7 Week 8	<p>1. Experience of small size machine</p> <p>2. Examination (Optional)</p>
Week 9	<p>1. Review</p> <p>2. Research paper or reports</p> <p>3. Mid-term Exam or term paper</p>
Week 10	<p>Percentage (I)</p> <p>1. Normal probability</p> <p>2. Random number</p> <p>3. Artificial interruption</p> <p>Psychology of gaming</p>
Week 11	<p>Percentage (II)</p> <p>1. To test program by artificial intelligence</p> <p>2. To test program by statistics</p> <p>3. Technology of probability control</p>
Week 12	<p>Experience of real machine(I)</p> <p>1. Link of machines</p> <p>2. problem solving</p> <p>3. Password application</p> <p>4. Security and reliability of telecommunication</p>
Week 13	<p>Experience of real machine(II)</p> <p>1. stability and design technology of IC board</p> <p>2. Anti-copy technology of IC board</p> <p>3. Reverse engineering of IC board</p> <p>Strategy of anti-copy</p>
Week 14	<p>Experience of real machine(III)</p> <p>1. programming</p> <p>Software engineering game design</p>
Week 15	<p>Experience of game business</p>

	1. QC department Architecture of R & Q
Week 16	1. IP of arcade machine 2. Research of software protection 3. Research of hardware protection 4. The usage of CPLD & FPGA Analysis of various IP benefit
Week 17	1. Discuss 2. Review of the course
Week 18	Final Exam

Grading Plan for course:

Paper, or Midterm	30 % +	Final Exam	40 % =	70%
Homework, Participation, and/or Class work				30%
Total				100%