

目录

0007156 色彩学基础.....	4
0007156 Fundamentals of Chromatics.....	5
0007442 面向对象程序设计 (C++)	6
0007442 Object-Oriented Programming (C++).....	7
0007909 离散数学.....	9
0007909 Discrete Mathematics.....	10
0007743 计算机系统平台.....	11
0007743 Computer System Platform	12
0010066 草图与透视基础.....	13
0010066 Fundamentals of Sketch and Perspective	14
0010661 数字摄影.....	15
0010661 Digital Photography	16
0008186 数据结构与算法.....	17
0008186 Data Structures and Algorithms	18
0002549 数据库原理 I	19
0002549 Principles of database I	20
0010083 动画基础.....	21
0010083 The Basis of Animation.....	22
0010141 三维美术设计基础.....	23
0010141 Practice of 3D Art and Design.....	24
0010718 软件工程导论 (双语)	25
0010718 Introduction to Software Engineering.....	26
0010746 游戏设计概论 (双语)	27
0010746 Introduction to Game Design and Development.....	28
0007755 计算机图形学.....	29
0007755 Computer Graphics	30
0010720 JAVA 程序设计 (自学)	31
0010720 Java Programming.....	32
0009133 面向对象程序设计 (C++) 课设.....	33
0009133 Object-Oriented Programming (C++) Course Project.....	34
0007155 认识实习.....	35
0007155 Cognitive Practice.....	36
0009048 数据结构与算法课设.....	37
0009048 Data Structures and Algorithms Course Project.....	38

0008464 工作实习.....	39
0008464 Work Practice.....	40
0006456 毕业设计（论文）.....	41
0006456 Graduation Project.....	42
0010084 动画影片创作.....	43
0010084 Animation Creation.....	44
0010143 三维实时渲染美术资产设计.....	45
0010143 Practice of Game Development Course Design.....	46
0008177 虚拟现实技术课设.....	47
0008177 Virtual Reality Development.....	48
0010125 移动应用开发设计与实践.....	49
0010125 Mobile Application Development Design and Practice.....	50
0010150 游戏开发实践.....	51
0010150 Practice of Game Development Course Design.....	52
0010148 视觉传达设计.....	53
0010148 Visual Communication Design.....	54
0008158 算法设计与分析.....	55
0008158 Design and Analysis of Algorithms.....	56
0010137 游戏开发技术基础.....	57
0010137 Fundamentals of game development technology.....	58
0007468 游戏引擎分析.....	59
0007468 Analysis of Game Engine.....	60
0008179 艺用解剖.....	61
0008179 Artistic Anatomy.....	62
0001640 数字图像处理.....	63
0001640 Digital Image Processing.....	64
0008173 虚拟现实技术.....	69
0008173 Virtual Reality Technology.....	70
0008410 三维计算机图形学及 3D 技术.....	71
0008410 3D Computer Graphics & 3D Technologies.....	72
0010660 移动应用开发.....	73
0010660 Mobile Application Development.....	74
0010142 三维模型制作.....	75
0010142 3D model design.....	76
0010092 高级游戏引擎应用.....	77

0010092 Application of Unreal engine	78
0010134 影视后期合成.....	79
0010134 Film and Television Post Synthesis.....	80
0009394 新生研讨课.....	81
0009394 Freshman Seminar.....	82
0010663 学术写作课程.....	83
0010663 Academic Writing.....	84
0010719 学术前沿课程.....	85
0010719 Academic Frontiers	86

0007156 色彩学基础

课程编码：0007156

课程名称：色彩学基础

英文名称：Fundamentals of Chromatics

课程类型：学科基础必修课

学 分：2.0 总学时： 32

面向对象：数字媒体技术专业本科生

先修课程：无

考核形式：作业成绩加权（不设考试）

撰写人：李宇彤

课程简介：

色彩学基础，要求学生掌握色彩学的基本理论和色彩构成美的规律，能运用色彩调和的理论与方法，设计规划构成主体画面的颜色各个要素，并运用于设计之中。使学生在较短的时间内，认识色彩的本质规律，能够独立完成色彩的分析、提取与重组，达到和谐有序的视觉效果。进而将其规律用于空间环境的色彩气氛的把握。

推荐教材或主要参考书：

[1] 苏华. 色彩设计基础. 清华大学出版社, 2003年9月

[2] 加文.安布罗斯 保罗.哈里斯. 国际平面设计基础教程5 色彩设计, 中国青年出版社, 2006年10月

[3] 王福阳 绘画色彩学基础教程 福建美术出版社 2008.11 高等教育“十一五”全国规划教材

0007156 Fundamentals of Chromatics

Course Number: 0007156

Course Title: Fundamentals of Chromatics

Course Type: Subject basic compulsory course

Credit: 2.0 **Total Credit Hours:** 32

Students: Undergraduate students majoring in Digital media technology

Prerequisites: None

Evaluation Method: Weighted performance (no examination)

Writer: Li Yutong

Course Description:

The basis of chromatics requires students to master the basic theory of chromatics and the law of color formation beauty, and be able to use the theory and method of color harmony to design and plan the color elements of the main picture, which can be used in the design. So that students can understand the essential law of color in a short time, and can independently complete the analysis, extraction and reorganization of color, so as to achieve a harmonious and orderly visual effect. Then its law is used to grasp the color atmosphere of the space environment.

Recommended Textbooks/References:

1. Su Hua. Fundamentals of color design. Tsinghua University Press, September 2003
2. Garvin Ambrose, Paul Harris. Basic course of international graphic design 5 color design, China Youth Press, October 2006
3. Wang Fuyang basic course of painting colorology Fujian Fine Arts Publishing House 2008.11 higher education "Eleventh Five Year Plan" national planning textbook

0007442 面向对象程序设计（C++）

课程编码：0007442

课程名称：面向对象程序设计（C++）

英文名称：Object-Oriented Programming (C++)

课程类型：学科基础必修课

学分： 2.0 **总学时：** 32

面向对象：数字媒体技术专业本科生

先修课程：高级语言程序设计

考核形式：平时成绩+考试

撰写人：王志强

课程简介：

本课程是数字媒体技术专业的重要基础课，旨在为学生提供深入了解计算机软件开发的核心方法和工具，以便应用于程序设计、系统设计、系统分析和系统测试等各个开发阶段。通过本课程，学生将建立坚实的面向对象程序设计基础，掌握 C++ 语言的关键概念和编程技术，为未来的系统分析、系统设计和系统测试课程奠定基础。课程将深入研究面向对象程序设计的核心思想，包括封装、继承和多态等概念。学生将了解如何将问题抽象为对象，并如何有效地组织和管理这些对象。课程将介绍 C++ 语言的基本语法和特性。学生将学会如何定义类和声明对象，以及如何使用虚函数、派生类和抽象基类等 C++ 语言功能。课程将向学生讲授在 VC++ 或 VS 集成开发环境下进行编程的技术。学生将获得实际操作经验，以便更好地应用所学知识。课程还强调采用面向对象思想来分析和解决实际问题的方法。学生将学会如何设计对象、分析对象之间的关联，以及如何构建具有良好程序结构和多态性应用的软件系统。通过参加本课程，学生将建立扎实的面向对象程序设计基础，掌握关键的 C++ 编程技能，并能够运用这些知识解决复杂的数字媒体技术领域的问题。这将为他们的职业发展和未来的学术研究打下坚实的基础。

推荐教材或主要参考书：

[1]陈维兴, 林小茶. C++面向对象程序设计（第4版）.清华大学出版社, 2018.1

[2]Stephen Prata. C++ Primer Plus（Fifth Edition）. SAMS.

[3]史蒂芬·普拉达. C++ primer plus（第6版 中文版）. 人民邮电出版社.

[4]郑莉, 董江鹏. C++语言程序设计（第4版）.清华大学出版社, 2010.7

0007442 Object-Oriented Programming (C++)

Course Number: 0007442

Course Title: Object-Oriented Programming (C++)

Course Type: Subject basic compulsory course

Credit: 2.0 **Total Credit Hours:** 32

Students: Undergraduate students majoring in Digital media technology

Prerequisites: High level language programming

Evaluation Method: Course participation + written exams

Writer: Wang Zhiqiang

Course Description:

The course is an essential foundational course for the Digital Media Technology major. It aims to provide students with an in-depth understanding of the core methods and tools of computer software development to be applied in various development phases, such as program design, system design, system analysis, and system testing. Through this course, students will establish a strong foundation in object-oriented programming, master key concepts and programming techniques in C++, and lay the groundwork for future courses in system analysis, system design, and system testing. The course delves into the core concepts of object-oriented programming, including encapsulation, inheritance, and polymorphism. Students will learn how to abstract problems into objects and effectively organize and manage these objects. The course introduces the basic syntax and features of the C++ language. Students will learn how to define classes, declare objects, and use C++ language features such as virtual functions, derived classes, and abstract base classes. The course teaches students programming techniques in the VC++ or VS Code integrated development environment. Students will gain practical experience to better apply the knowledge they acquire. The course also emphasizes the use of object-oriented thinking to analyze and solve real-world problems. Students will learn how to design objects, analyze the relationships between objects, and build software systems with good program structure and polymorphic applications. By participating in this course, students will build a strong foundation in object-oriented programming, master key C++ programming skills, and be able to apply this knowledge to solve complex problems in the field of digital media technology. This will provide a solid foundation for their career development and future academic research.

Recommended Textbooks/References:

1. Chen Weixing, Lin Xiaocha. C++ Object-Oriented Programming (4th Edition). Tsinghua University Press, 2018.1
2. Stephen Prata. C++ Primer Plus (Fifth Edition). SAMS.
3. Stephen Prata. C++ Primer Plus (6th Edition, Chinese Edition). People's Posts and

Telecommunications Press.

4. Zheng Li, Dong Jiangpeng. C++ Language Programming (4th Edition). Tsinghua University Press, 2010.7

0007909 离散数学

课程编码: 0007909

课程名称: 离散数学

英文名称: Discrete Mathematics

课程类型: 学科基础必修课

学分: 3.0 **总学时:** 54

面向对象: 数字媒体技术专业本科生

先修课程: 线性代数（工），高等数学（工）

考核形式: 平时成绩+考试

撰写人: 句福娇

课程简介:

离散数学是信息学部为软件工程专业本科生开设的学科基础必修课程类型。本课程的任务是旨在继高等数学后，针对软件工程师培养数学逻辑思维能力、学习基本思维方法和研究方法；使学生具有现代数学的观点和方法，并初步掌握处理离散结构所必须的描述工具和方法；引导学生追求从问题出发，通过逻辑去解决问题，抽象程序模型，使学生具有良好的开拓专业理论的素质和使用所学知识分析和解决实际问题的能力，为学生以后学习其他专业课程打下良好的基础。教学内容重点：有关命题逻辑、谓词逻辑、集合论、代数系统、图论等。教学内容的难点：创新能力、抽象思维和概括能力、严谨的数学推理的能力培养。

推荐教材或主要参考书:

[1] 邓米克, 全笑梅, 刘兆英主编. 离散数学. 电子工业出版社, 2020年12月

0007909 Discrete Mathematics

Course Number: 0007909

Course Title: Discrete Mathematics

Course Type: Subject basic compulsory course

Credit: 3.0 **Total Credit Hours:** 54

Students: Undergraduate students majoring in Digital media technology

Prerequisites: Linear algebra, advanced mathematics

Evaluation Method: Course participation + written exams

Writer: Ju Fujiao

Course Description:

Discrete Mathematics is a subject compulsory course for undergraduate students majoring in software engineering at the Faculty of Information Technology. Following the advanced mathematics course, this course aims to develop the logical thinking ability for software engineers. It introduces to students the fundamental thinking and research methods required to master the view and method of modern mathematics. Students will also learn the necessary tools and methods to deal with discrete structures and be able to abstract a program model by solving problems using logic. This course emphasizes developing students' professional theory and practical problem-solving skills to establish a strong foundation for future courses.

The course covers various topics such as propositional logic, predicate logic, set theory, algebraic systems, and graph theory. Meanwhile, the course content is challenging and requires students to develop their innovation, abstract thinking, generalization, and rigorous mathematical reasoning abilities.

Recommended Textbooks/References:

1. Deng Mike, Quan Xiaomei, Liu Zhaoying, Discrete Mathematics, *Publishing House of Electronics Industry*, 12-2020

0007743 计算机系统平台

课程编码: 0007743

课程名称: 计算机系统平台

英文名称: Computer System Platform

课程类型: 学科基础必修课

学分: 3.0 **总学时:** 48

面向对象: 数字媒体技术专业本科生

先修课程: 无

考核形式: 平时成绩+考试

撰写人: 张丽

课程简介:

计算机系统平台是信息学部为数字媒体技术专业本科生开设的学科基础必修课。本课程的任务是将计算机组成原理、操作系统、计算机网络等几门计算机专业方向专业课的核心内容,根据数字媒体专业学生对于计算机系统知识的需求和培养目标进行适当剪裁,通过这些教学内容使学生能够深刻地理解计算机系统的各种表象和行为,从而为数字媒体技术专业其他课程的学习奠定基本的计算机技术基础。同时计算机系统设计中的思想和算法也为学生设计数字媒体系统提供基本的思维训练。教学内容重点:操作系统内部实现机制以及计算机网络及服务的基本原理。教学内容的难点:操作系统的资源管理机制。

推荐教材或主要参考书:

[1] 张丽, 李晓明, 计算机系统平台, 清华大学出版社, 2009年7月

[2] James f. kurose, Keith w. ross (著), 陈鸣(译), 计算机网络:自顶向下方法, 机械工业出版社, 2018年6月

[3] William stallings (著), 陈向群(译), 操作系统——精髓与设计原理(第九版), 电子工业出版社, 2020年7月

0007743 Computer System Platform

Course Number: 0007743

Course Title: Computer System Platform

Course Type: Subject basic compulsory course

Credit: 3.0 **Total Credit Hours:** 48

Students: Undergraduate students majoring in Digital Media Technology

Prerequisites: None

Evaluation Method: Course participation + written exams

Writer: Zhang Li

Course Description:

Computer system platform is a subject basic compulsory course for undergraduates majoring in digital media technology. The task of this course is to enable students to deeply understand various representations and behaviors of computer system, so as to lay a basic computer technology foundation for other courses of digital media technology major. The core contents of professional courses of computer science, such as computer composition principle, operating system and computer network, are appropriately tailored according to the needs and training objectives of students majoring in digital media for computer system knowledge, At the same time, the ideas and algorithms in computer system design also provide basic thinking training for students to design digital media system. Key points of teaching content: internal implementation mechanism of operating system and basic principles of computer network and service. The difficulty of teaching content: resource management mechanism of operating system.

Recommended Textbooks/References:

1. Zhang Li, Li Xiaoming, computer system platform, *Tsinghua University Press*, July-2009
2. James F. kurose, Keith W. Ross, Chen Ming, computer networks: a top-down approach, *China Machine Press*, June-2018

William Stallings, Chen Xiangqun, operating system: essence and design principles (9th Edition), *Electronic Industry Press*, July-2020

0010066 草图与透视基础

课程编码: 0010066

课程名称: 草图与透视基础

英文名称: Fundamentals of Sketch and Perspective

课程类型: 学科基础必修课

学分: 3.0 **总学时:** 48

面向对象: 数字媒体技术专业本科生

先修课程: 无

考核形式: 考察

撰写人: 李蔚然

课程简介:

“草图与透视基础”设置于第 3 学期，是一门旨在增强视觉认识与速写技能的基础课程。人眼获取的信息是由颜色和形状构成的平面图像，通过对平面形状的分析识别三维空间。反过来，掌握观察方法，运用平面视觉元素，即可描绘，再现三维空间。“草图与透视”课程会探讨人对视觉信息的获取与认识过程，学习透视原理，积累视觉经验，理性分析平面图像对空间的反映与描述。本课程训练学生草图绘制技术，利用传统和数字方式，在平面画布快速描绘物体、角色，营造出可信的三维空间，进而利用这种技能表述事件与场景。课程需要准备铅笔、橡皮、画板等工具。

推荐教材或主要参考书:

[1] 殷光宇. 透视, 中国美术学院出版社, 1999.1

[2] 赵复雄, 崔琳琳. 实用透视学/普通高等院校“十三五”规划教材·艺术教育系列, 清华大学出版社, 2018.11

[3] [德] 迪特尔·普林茨. 建筑思维的草图表达, 江苏凤凰科学技术出版社, 2017.3

0010066 Fundamentals of Sketch and Perspective

Course Number: 0010066

Course Title: Fundamentals of Sketch and Perspective

Credit: 3.0 **Total Credit Hours:** 48

Course Type: Subject basic compulsory course

Students: Undergraduate students majoring in Digital media technology

Prerequisites: None

Evaluation Method: General Assessment

Writer: Li Weiran

Course Description:

" Fundamentals of Sketch and Perspective " is in the third semester, which is designed to enhance visual understanding and sketching skills. The information obtained by the human eye is a flat image composed of color and shape, which identifies three-dimensional space through the analysis of the flat shape. On the contrary, mastering observation methods and using planar visual elements can depict and reproduce three-dimensional space. The course " Fundamentals of Sketch and Perspective " will explore the process of human acquisition and understanding of visual information, learn the principles of perspective, accumulate visual experience, and rationally analyze the reflection and description of flat images on space. This course trains students in sketching techniques, using traditional and digital methods to quickly depict objects and characters on a flat canvas, creating a trustworthy three-dimensional space, and then using this skill to express events and scenes. The course requires preparation of tools such as pencils, erasers, and drawing boards.

Recommended Textbooks/References:

1. Yin Guangyu, Perspective, China Academy of Art Press, 1999.1
2. Zhao Fuxiong, Cui Linlin, Practical perspective, tsinghua university press, 2018.11
3. Dieter Prjnz, Sketch Expression of Architectural Thinking, Jiangsu Phoenix Science and Technology Press, 2017.3

0010661 数字摄影

课程编码：0010661

课程名称：数字摄影

英文名称：Digital Photography

课程类型：学科基础必修课

学分：2.0 **总学时：**32

面向对象：数字媒体技术专业本科生

先修课程：色彩学基础

考核形式：考察

撰写人：李蔚然

课程简介：

视觉艺术、实用化的视觉产品和支撑其生成、展现计算机图形图像技术是数字媒体技术专业的研究对象。摄影通过光学器材获取影像，原理与人眼相似，是快捷获取影像的手段。数字媒体技术专业的本科生，不论发展方向如何，都必须掌握影像获取与加工技术，包括静止影像（图片）和活动影像（影片）。在 32 学时内，学生将学习摄影原理，提升视觉审美，拓展验证视觉经验，实践照片和影片拍摄，运用软件加工影像素材，独立完成多个图片摄影训练，分组完成短片摄影作品。

推荐教材或主要参考书：

[1] 美国纽约电影学院. 美国纽约电影学院摄影教材（最新修订版 II）. 中国摄影出版社，2010 年 8 月

[2] [法]邦雅曼·贝热里（Benjamin Bergery）著. 光影创作课：21 位电影摄影大师的现场教学（修订版）. 刘欣 唐强 译. 文化发展出版社，2018 年 5 月第 1 版

0010661 Digital Photography

Course Number: 0010661

Course Title: Digital Photography

Course Type: Subject basic compulsory course

Credit: 2.0 **Total Credit Hours:** 32

Students: Undergraduate students majoring in Digital media technology

Prerequisites: Fundamentals of Chromatics

Evaluation Method: General Assessment

Writer: Li Weiran

Course Description:

Visual art, practical visual products, and computer graphics and image technology that support their generation and presentation are the research objects of the major digital media technology. The principle of photography is similar to that of human eyes, it is a fast way to obtain images. Undergraduate students majoring in digital media technology must master image acquisition and processing technologies, including still images (images) and moving images (films), regardless of their development direction. Within 32 class hours, students will learn the principles of photography, enhance visual aesthetics, expand and validate visual experience, practice photo and film shooting, use software to process image materials, independently complete multiple photo photography training, and group together to complete short film photography works..

Recommended Textbooks/References:

1. New York Institute of Photography, New York Institute of Photography photography teaching materials (2nd edition), China Photographic Publishing House, 2010.8
2. Benjamin Bergery, Reflections: Twenty-one Cinematographers at Work, Cultural Development Press, 2018.5

0008186 数据结构与算法

课程编码: 0008186

课程名称: 数据结构与算法

英文名称: Data Structures and Algorithms

课程类型: 学科基础必修课

学分: 3.5 **总学时:** 56

面向对象: 数字媒体技术专业本科生

先修课程: 高级语言程序设计, 面向对象程序设计 (C++), 离散数学

考核形式: 平时成绩+考试

撰写人: 陈洪丽

课程简介:

数据结构与算法是信息学部软件学院为软件工程专业本科生开设的学科基础必修课。数据结构与算法课程是研究数据的各种组织形式以及建立在这些结构上的各种运算算法的实现,它不仅为计算机语言进行编程提供了方法性的理论指导,更高层次上总结了程序设计的常用方法和技巧。同时也包括在计算机中如何有效地表示数据,如何合理地组织数据和处理数据,以及初步的算法设计和算法性能分析技术。教学内容重点是围绕着线性表、栈和队列、数组、串和广义表、树和二叉树、图等基本数据结构,以及查找和内部排序这两种常用的数据处理技术来组织。教学内容难点是理论与实践紧密结合,运用这些知识解决实际的问题。

推荐教材或主要参考书:

- [1] 殷人昆 编著, 数据结构(用面向对象方法与 C++语言描述) (第 2 版), 清华大学出版社, 2018 年 1 月
- [2] (美) SARTAJ SAHNI, 数据结构、算法与应用—C++语言描述, 机械工业出版社, 2013 年 9 月
- [3] Jeffrey D. Ullman 等, 数据结构与算法 (影印版), 清华大学出版社, 2003 年 12 月
- [4] 李春葆主编, 数据结构教程 (第 5 版), 清华大学出版社, 2017 年 5 月

0008186 Data Structures and Algorithms

Course Number: 0008186

Course Title: Data Structures and Algorithms

Course Type: Subject basic compulsory course

Credit: 3.5 **Total Credit Hours:** 56

Students: Undergraduate students majoring in Digital media technology

Prerequisites: High level language programming, Object-Oriented Programming (C++), discrete mathematics

Evaluation Method: Course participation + written exams

Writer: Chen Hongli

Course Description:

Data structures and algorithms is a basic compulsory course for software engineering majors in the Department of Software Engineering at the Faculty of Information Technology. Students in this course will learn various organization forms of data and the implementation of diverse calculation algorithms based on these structures. Not only does it provide theoretical guidance for computer language programming, but it also summarizes the common methods and skills of program design at a higher level. The course introduces how to display, organize, and process data reasonably and effectively and presents preliminary algorithm design and performance analysis technology. The teaching focus of this course covers fundamental data structures (e.g., linear table, stack and queue, array, string and generalized table, tree and binary tree, and graph) and two commonly used search and internal sorting data processing technologies. This course's difficulty is combining theory with practice closely and solving practical problems with this knowledge.

Recommended Textbooks/References:

1. Yin renkun, data structure (described by object-oriented method and C++ language) (2nd Edition), Tsinghua University Press, January 2018
2. Sartaj Sahni, data structure, algorithm and Application – C++language description, China Machine Press, September 2013
3. Jeffrey D. Ullman et al., data structure and algorithm (photocopy edition), Tsinghua University Press, December 2003
4. Li Chunbao, editor in chief, data structure course (5th Edition), Tsinghua University Press, may 2017

0002549 数据库原理 I

课程编码: 0002549

课程名称: 数据库原理I

英文名称: Principles of database I

课程类型: 学科基础必修课

学分: 3.0 **总学时:** 48

面向对象: 数字媒体技术专业本科生

先修课程: 数据结构与算法、计算机系统平台

考核形式: 平时成绩+期末考试

撰写者: 肖扬

课程简介:

数据库技术是计算机科学领域发展最快、应用最广的技术之一，是必不可少的是应用软件。目前应用软件均要涉及数据的存储和查询，即数据库技术的应用。这样就形成了数据库设计及应用、数据库基本理论、数据库管理系统的研制三个领域的庞大市场，数据库原理是研究这三个领域的基础课程。数据库原理是研究如何存储、使用和管理数据的一门学科，是计算机软件学科的一个重要分支。随着计算机应用的发展，数据库应用领域已从数据处理、信息管理、事务处理扩大到计算机辅助设计、人工智能、办公信息系统和网络应用等新的应用领域。经过三十多年的发展，数据库技术已形成完整的理论体系和一大批实用系统，因而本课程具有较强的理论性、实用性和可操作性。

推荐教材或主要参考书:

- [1] 王珊, 萨师煊. 数据库系统概论 (第五版). 北京: 高等教育出版社, 2014 年 9 月
- [2] Baklarz G. DB2 9 for Linux UNIX Windows 数据库管理认证指南 (原书第 6 版). 2009 年 4 月

0002549 Principles of database I

Course Number: 0002549

Course Title: Principles of database I

Course Type: Subject basic compulsory course

Credit: 3.0 **Total Credit Hours:** 48

Students: Undergraduates majoring in Digital media technology

Prerequisites: Data Structures and Algorithms, Computer System Platform

Evaluation Method: Normal results + final exam

Writer: Xiao Yang

Course Description:

Database technology is one of the fastest-growing and most widely used technologies in the field of computer science, and application software is essential. At present, application software involves data storage and query, that is, the application of database technology. In this way, a huge market has been formed in three fields: database design and application, basic database theory, and database management system development. Database principles are the basic courses for studying these three fields. Database principle is a discipline that studies how to store, use and manage data, and it is an important branch of computer software discipline. With the development of computer applications, the field of database applications has expanded from data processing, information management, and transaction processing to new applications such as computer-aided design, artificial intelligence, office information systems, and network applications. After more than 30 years of development, database technology has formed a complete theoretical system and a large number of practical systems, so this course has strong theoretical, practical and operability.

Recommended Textbooks/References:

1. Wang Shan, Sa Shixuan. Introduction to Database Systems (Fifth Edition). *Beijing: Higher Education Press*, September 2014
2. Baklarz G. DB2 9 for Linux UNIX Windows, *Database Management Certification Guide (Original Book 6th Edition)*. April 2009

0010083 动画基础

课程编码：0010083

课程名称：动画基础

英文名称：The Basis of Animation

课程类型：学科基础必修课

学分：2.0 **总学时：**32

面向对象：数字媒体技术专业本科生

先修课程：色彩学基础、草图与透视基础、数字摄影

考核形式：考察

撰写者：李蔚然

课程简介：

“动画基础”设置于第4学期，是学科基础必修课，以理论教学为主；“动画影片创作”是它的实践环节，独立设课。两门课程相辅相成，最终完成一部动画影片。“动画基础”课时有限，学习内容相对庞杂，涵盖视听语言，影视与动画作品分析，动画运动规律，动画生产流程和工具等。通过学习与训练，学生能够使用造型手段，合理选择数字化生产工具，在较短时间内得到完整可行的视听语言叙事方案。

推荐教材或主要参考书：

- [1] 贾否. 动画概论（第三版）. 中国传媒大学出版社，2010.8
- [2] 晓欧.张天晓.舒霄. 动画设计稿. 机械工业出版社，2006.2

0010083 The Basis of Animation

Course Number: 0010083

Course Title: The Basis of Animation

Course Type: Subject basic compulsory course

Credit: 2.0 **Total Credit Hours:** 32

Students: Undergraduates majoring in Digital media technology

Prerequisites: Fundamentals of Chromatics, Fundamentals of Sketch and Perspective, Digital Photography

Evaluation Method: General Assessment

Writer: Li Weiran

Course Description:

" The Basis of Animation " is set up in the fourth semester, which is a compulsory course of discipline foundation, focusing on theoretical teaching; "Animation creation" is its practical aspect, with independent courses. The two courses complement each other and ultimately lead to the completion of an animated film. The "Animation Fundamentals" course has limited hours and relatively complex learning content, covering audiovisual language, analysis of film and animation works, animation motion patterns, animation production processes and tools, etc. Through learning and training, students are able to use modeling techniques, reasonably choose digital production tools, and obtain a complete and feasible audio-visual language narrative plan in a relatively short period of time.

Recommended Textbooks/References:

1. Jia Fou, Understanding Animation (3rd Edition), Communication University of China Press 2010.8
2. Xiao Ou, Zhang Tianxiao, Shu Xiao, Animation Layout, Machinery Industry Press 2006.2

0010141 三维美术设计基础

课程编码：0010141

课程名称：三维美术设计基础

英文名称：Practice of 3D Art and Design

课程类型：学科基础必修课

学分：3.0 **总学时：**48

面向对象：数字媒体技术专业本科生

先修课程：无

考核形式：大作业

撰写者：朱文哲

课程简介：

三维美术设计基础是信息学部为数字媒体技术专业本科生开设的一门学科基础必修课。内容主要涉及，三维美术设计的基本概念与三维美术设计的基本要求，三维美术资产设计制作的基本流程。旨在培养学生在数字媒体技术领域尤其是数字游戏设计与开发领域所具备的三维美术设计制作的基本能力，掌握三维美术设计的基本流程和基本方法，为以后的数字游戏软件设计开发打下必要的实践基础。

推荐教材或主要参考书：

[1] Autodesk maya 官方技术文档

0010141 Practice of 3D Art and Design

Course Number: 001141

Course Title: Practice of 3D Art and Design

Course Type: Subject basic compulsory course

Credit: 3.0 **Total Credit Hours:** 48

Students: Undergraduate students majoring in Digital Media Technology

Prerequisites: None

Evaluation Method: Course participation + works

Writer: Zhu Wenzhe

Course Description:

Practice of 3D Art and Design is one of the Subject basic compulsory courses for undergraduate students Major in Digital Media Technology. The content mainly involves the basic concepts and requirements of 3D art design, and the basic process of 3D art asset design and production. The aim is to cultivate students' basic abilities in 3D art design and production in the field of digital media technology, especially in the field of digital game design and development, to master the basic process and methods of 3D art design, and to lay a necessary practical foundation for future digital game software design and development.

Recommended Textbooks/References:

1. Autodesk Maya Official Technical Documentation

0010718 软件工程导论（双语）

课程编码：0010718

课程名称：软件工程导论（双语）

英文名称：Introduction to Software Engineering

课程类型：学科基础必修课

学分： 2.0 **总学时：** 32

面向对象：数字媒体技术专业本科生

先修课程：面向对象程序设计（C++），数据结构与算法, Java 程序设计

考核形式：平时成绩+考试

撰写者：于学军

课程简介：

软件工程导论是软件学院（信息学部）为数字媒体技术专业开设的学科基础必修课。课程设置过程中注重软件开发的工程性和实践性。以当前流行的统一开发过程、面向对象技术和 UML 语言为核心，以“软件建模与分析”、“软件设计”、“软件验证与确认”、“软件演化”、“软件过程”、“软件质量”为重点，结合软件开发的先进技术、实践和案例分析，讲解软件工程的“需求过程、需求获取方法，分析方法”、“软件架构设计及详细设计”、“软件测试”以及软件开发管理，使学生在理解和实践的基础上掌握基本的软件需求分析、建模、构建和使用相应 CASE 工具的能力，为软件工程专业学生解决复杂工程问题能力奠定基础。

推荐教材或主要参考书：

[1] Fank Tsui 等 软件工程导论 4th. 机械工业出版社，2018.9

[2] Ian Sommerville Software Engineering 9th. 机械工业出版社，2011.5

[3] Stephen R Schach Object-Oriented Classical Software Engineering 8th. 机械工业出版社，2012.7

0010718 Introduction to Software Engineering

Course Number: 0010718

Course Title: Introduction to Software Engineering

Course Type: Subject basic compulsory course

Credit: 2.0 **Total Credit Hours:** 32

Students: Undergraduate students majoring in Digital Media Technology

Prerequisites: Object-Oriented Programming Design,, Data Structure, Java Programming Basic

Evaluation Method: Course participation + written exams

Writer: Yu Xuejun

Course Description:

Introduction to Software Engineering is a required course for Digital Media Technology majors from the Dept. of Software Engineering (Faculty of Information Technology). This course pays attention to the engineering and practice of software development in the course setting. This course incorporates the modern development process, the current popular object-oriented technology, and UML language as its core, with "software modeling and analysis," "software design," "software verification and validation," "software evolution," "software process," "software quality" as its focus. Through applying software development's advanced technology, practice, and case studies, the course introduces requirement engineering, software design and architecture, testing, development, and management. By the end of this course, students will master fundamental software requirements analysis, modeling, construction, and corresponding CASE tools in both understanding and practice. As a major in Software Engineering, students will be equipped with the skills to solve complex engineering problems, which serves as a foundation for their future career.

Recommended Textbooks/References:

1. Fank Tsui Introduction to Software Engineering 4th, China Machine Press, 2018.9
2. Ian Sommerville Software Engineering 9th. China Machine Press, 2011.5
3. Stephen R Schach Object-Oriented Classical Software Engineering 8th. China Machine Press, 2012.7

0010746 游戏设计概论（双语）

课程编码：0010746

课程名称：游戏设计概论（双语）

英文名称：Introduction to Game Design and Development

课程类型：学科基础必修课

学分： 2.0 **总学时：** 32

面向对象：数字媒体技术专业本科生

先修课程：无

考核形式：笔试

课程简介：

游戏设计概论是信息学部为数字媒体技术专业本科生开设的一门学科基础必修课。内容主要涉及，科学与艺术的关系，数字媒体技术与视频游戏的关系，视频游戏的历史沿革、游戏的本质、游戏机制、游戏美术、游戏故事讲述、视频游戏设计与开发流程等理论知识。使学生对视频游戏设计与开发有一个全面的了解，并掌握一定的游戏设计理论。理解视频游戏设计与开发的相关原理、以及游戏设计开发的一般流程和相关技术方法，为以后的视频游戏软件设计开发打下必要的理论基础。

推荐教材或主要参考书：

- [1] 1. Jesse Schell. 刘嘉俊译，游戏设计艺术（第三版）。电子工业出版社。2021年5月
- [2] Jesse Schell. The Art of Game Design, A book of lenses. 3rd Edition. CRC Press. （英文电子版）

0010746 Introduction to Game Design and Development

Course Number: 0010746

Course Title: Introduction to Game Design and Development

Course Type: Subject basic compulsory course

Credit: 2.0 **Total Credit Hours:** 32

Students: Undergraduate students majoring in Digital Media Technology

Prerequisites: None

Evaluation Method: Written exams

Writer: Zhu Wenzhe

Course Description:

Introduction to Game Design and Development is one of the Subject basic compulsory courses for undergraduate students Major in Digital Media Technology. The content mainly involves the relationship between science and art, the relationship between digital media technology and video games, the historical evolution of video games, the essence of games, game mechanics, game art, game storytelling, video game design and development process and other theoretical knowledge. It enables students to have a comprehensive understanding of video game design and development, and to master certain game design theories. Understand the relevant principles of video game design and development, as well as the general process and related technical methods of game development, laying a necessary theoretical foundation for future video game software design and development.

Recommended Textbooks/References:

1. Jesse Schell. Translated by Liu Jiajun, The Art of Game Design (Third Edition). Electronic Industry Press. May 2021
2. Jesse Schell. The Art of Game Design, A book of lenses. 3rd Edition. CRC Press. (English E-book)

0007755 计算机图形学

课程编码: 0007755

课程名称: 计算机图形学

英文名称: Computer Graphics

课程类型: 学科基础必修课

学分: 2.0 **总学时:** 32

面向对象: 数字媒体技术专业本科生

先修课程: 线性代数（工）、数据结构与算法、高级程序设计语言

考核形式: 平时成绩+考试

撰写者: 李天行

课程简介:

计算机图形学是信息学科的专业主干课程之一,以图形相关应用系统的人机交互功能及界面的实现为目标,是开发各不同领域计算机应用软件系统的基础性技术,在各种数字媒体处理系统、信息管理系统、军用、民用的控制系统、科学计算以及虚拟现实等应用系统中得到广泛使用。该课程的开设对于研究型及应用型人才的培养都具有重要作用。通过本课程的学习应使学生对图形系统硬件设备及软件的实现算法有较为全面的了解,从而具备设计、开发用户图形界面的能力及对各种应用系统的快速掌握能力。

推荐教材或主要参考书:

- [1] 倪明田等, 计算机图形学, 北京大学出版社, 2002
- [2] 杨钦, 徐永安, 翟红英著, 计算机图形学, 清华大学出版社, 2007
- [3] [美]Steve Cunningham 著, 石教英等译, 计算机图形学, 机械工业出版社, 2009
- [4] 黄静, 计算机图形学及其实践教程, 机械工业出版社, 2015

0007755 Computer Graphics

Course Number: 0007755

Course Title: Computer Graphics

Course Type: Subject basic compulsory course

Credit: 2.0 **Total Credit Hours:** 32

Students: Undergraduate students majoring in Digital media technology

Prerequisites: Linear Algebra, Data Structures and Algorithms, High level programming language

Evaluation Method: Course participation + written exams

Writer: Li Tianxing

Course Description:

Computer graphics is one of the major courses of information science. It aims at the realization of human-computer interaction function and interface of graphics related application system. It is the basic technology for developing computer application software systems in different fields, including various digital media processing systems, information management systems, military and civil control systems. It is widely used in scientific computing, virtual reality and other application systems. The course plays an important role in the cultivation of research and application-oriented talents. Through the study of this course, students should have a comprehensive understanding of the hardware equipment and software implementation algorithm of graphics system, so as to have the ability to design and develop user graphical interface and quickly master various application systems.

Recommended Textbooks/References:

1. Ni Mingtian, Computer Graphics, Peking University Press, 2002
2. Yang Qin, Xu Yongan, Zhai Hongying, Computer Graphics, Tsinghua University Press, 2007
3. Steve Cunningham, Computer Graphics, Machinery Industry Press, 2009
4. Huang Jing, Computer graphics and its practical course, Machinery Industry Press, 2015

0010720 JAVA 程序设计（自学）

课程编码：0010720

课程名称：JAVA 程序设计

英文名称：Java Programming

课程类型：学科基础必修课

学分：2.0 **总学时：**32

面向对象：数字媒体技术专业本科生

先修课程：高级语言程序设计，面向对象程序设计（C++）

考核形式：平时成绩+考查

撰写者：王岚

课程简介：

JAVA 程序设计是数字媒体技术专业的一门重要的专业选修课。Java 语言是互联网软件开发中最常用的软件开发工具，支持面向对象的软件设计与程序设计，提供程序设计实践训练。本课程侧重 Java 语言及其应用技术的学习，为后续课程中各种互联网软件系统开发技术的学习提供基础。本课程主要讲授 Java 面向对象编程思想及其 Java 语言的实现机制，Java 语言的基本语法和 Eclipse 等集成开发环境下的编程技术，介绍采用面向对象思想分析和解决问题的基本方法。通过本课程的学习，培养学生掌握面向对象程序设计的思想，掌握面向对象程序设计的 Java 语言实现方法，掌握 Java 语言的基本语法，熟悉用户界面软件开发和数据库应用接口等常见的软件开发应用技术，获得从事互联网应用程序设计的基本能力。

推荐教材或主要参考书：

[1]郎波.Java 语言程序设计（第三版）.清华大学出版社，2016.7

[2](美)埃克尔(Eckel,B.) 著 陈昊鹏 等译.Java 编程思想(第 4 版).机械工业出版社，2007.6

[3]孙卫琴.Java 面向对象编程（第 2 版）.清华大学出版社，2017.1

0010720 Java Programming

Course Number: 0010720

Course Title: Java Programming

Course Type: Subject basic compulsory course

Credit: 2.0 **Total Credit Hours:** 32

Students: Undergraduate students majoring in Digital media technology

Prerequisites: Advanced programming language Object-Oriented Programming (C++)

Evaluation Method: Course participation

Writer: Wang Lan

Course Description:

Java programming is an important professional elective course for the major of digital media technology. Java language is the most commonly used software development tool in software development. It supports object-oriented software design and programming, and provides programming practice training. This course focuses on the study of Java language and its application technology, which provides a basis for the study of various Internet software system development technologies in subsequent courses. This course mainly teaches the idea of java object-oriented programming, the basic syntax of Java language and the programming technology under the integrated development environment such as eclipse, and introduces the basic methods of analyzing and solving problems by using the idea of object-oriented programming. Through the study of this course, students will be trained to master the idea of object-oriented programming, master the Java language implementation method of object-oriented programming, master the basic syntax of Java language, be familiar with common software development application technologies such as user interface software development and database application interface, and obtain the basic ability to engage in Internet application design.

Recommended Textbooks/References:

1. Langbo. Java language programming(3rd) . Tsinghua university press, 2016.7
2. Eckel,B. Thinking in Java (4th). Machinery Industry Press, 2007.6
3. Sunweiqin . Java object oriented programming (2nd) . Tsinghua university press, 2017.1

0009133 面向对象程序设计（C++）课设

课程编码：0009133

课程名称：面向对象程序设计（C++）课设

英文名称：Object-Oriented Programming (C++) Course Project

课程类型：实践环节必修课

学分：1.0 **总学时：**30

面向对象：数字媒体技术专业本科生

先修课程：高级语言程序设计，面向对象程序设计（C++）

考核形式：平时成绩+学习报告

撰写人：王志强

课程简介：

面向对象程序设计（C++）课设是一门学科基础必修课程。本课程是【面向对象程序设计（C++）】课程教学的一个重要环节，主要任务是配合课堂教学所讲授的知识内容，进行相应的实验性操作，使学生在完成课设题目的过程中，逐步加深对课堂讲授内容的认识，培养学生面向对象的程序设计能力。教学内容重点是学生依据课堂讲授的相关知识，通过分析、设计、编程、调试等环节完成一个较大的实际应用项目，进而加深掌握程序设计的基本思想、基本流程，掌握程序设计的基本语法及掌握程序调试的基本流程；掌握主流的程序编辑、调试工具。教学内容的难点是综合运用所学的理论知识和方法解决实际问题，具体到分析和设计、编程、调试等环节的完成，用系统的观点和软件开发一般规范进行软件开发。

推荐教材或主要参考书：

[1]陈维兴，林小茶，C++面向对象程序设计（第4版），清华大学出版社，2018年1月

[2]Ian Sommerville Software Engineering 9th，机械工业出版社，2011年5月

[3]郑莉，董江鹏，C++语言程序设计（第4版），清华大学出版社，2010年7月

[4]埃克尔（美），C++编程思想（第2版），机械工业出版社，2017年8月

0009133 Object-Oriented Programming (C++) Course Project

Course Number: 0009133

Course Title: Object-Oriented Programming (C++) Course Project

Course Type: Compulsory course in practice

Credit: 1.0 **Total Credit Hours:** 30

Students: Undergraduate students majoring in Digital media technology

Prerequisites: High level language programming, Object-Oriented Programming (C++)

Evaluation Method: Course participation + Study Report

Writer: Wang Zhiqiang

Course Description:

The Object-Oriented Programming (C++) course project is a fundamental and compulsory subject. This course is a crucial component of the teaching of the "Object-Oriented Programming (C++)" course, with the main task being to complement the knowledge taught in the classroom through practical experiments. The aim is to deepen the students' understanding of the content presented in the classroom and cultivate their ability to design object-oriented programs. The focus of the teaching content is for students to apply the relevant knowledge taught in the classroom to analyze, design, program, debug, and complete a substantial real-world application project. This process helps them gain a better grasp of the fundamental concepts and processes of program design, understand basic programming syntax, and master the essential debugging processes. Students are also expected to become proficient in mainstream program editing and debugging tools. The challenging aspect of this teaching content lies in the synthesis of theoretical knowledge and methods learned to solve practical problems. This involves a systematic approach and adhering to general software development standards throughout the phases of analysis, design, programming, and debugging.

Recommended Textbooks/References:

1. Chen Weixing, Lin Xiaocha, C++object oriented programming (4th Edition), Tsinghua University Press, January, 2018
2. Ian Sommerville software engineering 9th, China Machine Press, may 2011
3. Zheng Li, Dong jiangpeng, C++language programming (4th Edition), Tsinghua University Press, July 2010
4. Eckel (USA), C++ programming ideas (2nd Edition), China Machine Press, August 2017

0007155 认识实习

课程编码：0007155

课程名称：认识实习

英文名称：Cognitive Practice

课程类型：实践环节必修课

学分：1.0 **总学时：**30

面向对象：数字媒体技术专业本科生

先修课程：新生研讨课

考核形式：平时成绩+报告

撰写者：朱文哲

课程简介：

认识实习是信息学部为数字媒体技术专业本科生开设的实践环节必修课。本课程主要为了让学生了解当前数字媒体技术应用情况，需求情况，发展方向及前景；通过将理论用于实践，提高学生发现问题并用所学知识分析问题和解决问题的能力，为学生能顺利与社会环境接轨做好准备。认识实习通过组织学生参观专业相关的企业、开展校际交流、领域专家讲座、专业介绍、师生讨论等方式提高学生对专业的认知度，使学生对所学专业建立感性认识，初步了解与专业学习和实践相关的内容、专业相关领域的发展趋势和前沿，初步了解未来就业环境。

推荐教材或主要参考书：

无

0007155 Cognitive Practice

Course Number: 0007155

Course Title: Cognitive Practice

Course Type: Compulsory course in practice

Credit: 1.0 **Total Credit Hours:** 30

Students: Undergraduate students majoring in Digital Media Technology

Prerequisites: Freshman Seminar

Evaluation Method: Course participation + Report

Writer: Zhu Wenzhe

Course Description:

Cognitive Practice is one of the Compulsory course in practice for undergraduate students Major in Digital Media Technology. The main target of this course is to help students understand the current application of digital media technology, its demand, development direction, and prospects. By applying theory to practice, it enhances students' ability to identify problems and use their knowledge to analyze and solve these problems, preparing students to smoothly integrate into the social environment. Internship Recognition improves students' understanding of their major by organizing visits to relevant enterprises, conducting inter-school exchanges, hosting lectures by field experts, introducing the major, and facilitating teacher-student discussions. It enables students to establish a perceptual understanding of their major, gain preliminary understanding of the content related to professional learning and practice, understand the development trends and frontiers in related fields of the major, and get a preliminary understanding of the future employment environment.

Recommended Textbooks/References:

None

0009048 数据结构与算法课设

课程编码: 0009048

课程名称: 数据结构与算法课设

英文名称: Data Structures and Algorithms Course Project

课程类型: 实践环节必修课

学分: 2.0 **总学时:** 60

面向对象: 数字媒体技术专业本科生

先修课程: 高级语言程序设计, 面向对象程序设计 (C++), 离散数学, 数据结构与算法

考核形式: 平时成绩+学习报告

撰写者: 陈洪丽

课程简介:

数据结构与算法课设是信息学部软件学院为软件工程专业本科生开设的实践环节必修课。本课程是“数据结构与算法”课程教学的一个重要环节, 主要任务是配合课堂教学所讲授的知识内容, 进行相应的实验性操作, 使学生在完成各个实验题目的过程中, 逐步加深对课堂讲授内容的认识, 并在理解基本数据结构和算法的基础上, 掌握利用数据结构的相关知识与技术, 解决实际问题的基本技能。教学内容重点是学生依据课堂讲授的相关知识, 通过分析、设计、编程、调试等环节独立完成一个较大的实际应用项目。教学内容的难点是综合运用所学的理论知识和方法解决实际问题, 具体到分析和设计、编程、调试等环节的完成, 用系统的观点和软件开发一般规范进行软件开发。

推荐教材或主要参考书:

无

0009048 Data Structures and Algorithms Course Project

Course Number: 0009048

Course Title: Data Structures and Algorithms Course Project

Course Type: Compulsory course in practice

Credit: 2.0 **Total Credit Hours:** 60

Students: Undergraduate students majoring in Digital Media Technology

Prerequisites: High level language programming, Object-Oriented Programming (C++), discrete mathematics ,Data Structures and Algorithms

Evaluation Method: Course participation + Study Report

Writer: Chen Hongli

Course Description:

The Course Project of Data Structures and Algorithms is a compulsory course for software engineering undergraduates in the Dept. of Software Engineering. The course aims to help students understand the basic knowledge of data structure they have learned in the Data Structures and Algorithms course, and build up their competence in solving practical problems by practicing data structure-related methods and technologies step-by-step. The teaching focus consists of two parts: guiding students to complete a sizeable practical application project independently by applying analysis, design, programming, and debugging skills they have learned in class. The challenge of this course is three-fold: (1) applying the theoretical knowledge and methods to solve practical problems, (2) completing the entire task, from analyzing, designing, programming, and debugging, and (3) developing the software with a system viewpoint and the general standard of software development.

Recommended Textbooks/References:

None

0008464 工作实习

课程编码: 0008464

课程名称: 工作实习

英文名称: Work Practice

课程类型: 实践环节必修课

学分: 4.0 **总学时:** 120

面向对象: 数字媒体技术专业本科生

先修课程: 面向对象程序设计(C++)课设, 软件工程导论, 游戏设计概论, 游戏开发实践, 三维美术设计基础

考核形式: 考查

撰写者: 朱文哲

课程简介:

工作实习是信息学部为数字媒体技术专业本科生开设的实践环节必修课。是在学生已经掌握了大部分专业知识、有一定的实践能力的前提下,学院与企业共同创建学生工作实习的机会,使得学生通过参与企业项目的设计与开发、运用已经掌握的基础知识和专业知识,了解、研究、分析计算系统的设计、开发、利用中实际的复杂问题,并通过文献查阅、小组讨论、信息综合以获得有效结论,增强其独立解决实际问题的能力以及团队协作能力和自学能力。同时,工作实习将培养学生在解决这些复杂问题过程中,能够综合考虑和评价其对社会、健康、安全、法律以及文化的影响。

推荐教材或主要参考书:

无

0008464 Work Practice

Course Number: 0008464

Course Title: Work Practice

Course Type: Compulsory course in practice

Credit: 4.0 **Total Credit Hours:** 120

Students: Undergraduate students majoring in Digital Media Technology

Prerequisites: Object-oriented Programming (C++) Course Design, Software Engineering, Introduction to Game Design and Development, Practice of 3D Art and Design, Practice of Game Development Course Design

Evaluation Method: Course participation + written report + oral presentation + defense

Writer: Zhu Wenzhe

Course Description:

Work Practice is one of the Compulsory course in practice for undergraduate students Major in Digital Media Technology. It is an opportunity created jointly by the college and enterprises for students who have already mastered most of the professional knowledge and have certain practical abilities. Students can participate in the design and development of enterprise projects, apply their basic knowledge and professional knowledge, understand, research, and analyze the actual complex problems in the design, development, and utilization of computing systems. They can also obtain effective conclusions through literature review, group discussion, and information synthesis, thereby enhancing their ability to solve practical problems independently as well as their team collaboration skills and self-learning abilities. At the same time, the work internship will cultivate students' ability to comprehensively consider and evaluate the impact of these complex problems on society, health, safety, law, and culture during the problem-solving process.

Recommended Textbooks/References:

None

0006456 毕业设计（论文）

课程编码：0006456

课程名称：毕业设计（论文）

英文名称：Graduation Project

课程类型：实践环节必修课

学分： 8.0 **总学时：** 480

面向对象：数字媒体技术专业本科生

先修课程：

考核形式： 论文+答辩

撰写者：朱文哲

课程简介：

毕业设计是重要的必修实践教学环节,通过课题选择与系统实现、撰写论文等实践活动,使学生进一步掌握本专业的基本知识、基本技术和基本方法,综合地、灵活地运用所学基础理论和专业技能解决数字媒体技术专业实际问题,并经历解决复杂工程问题的求解过程,从而得到全面训练。在毕业设计期间,学生必须通过选题、资料阅读、选择和使用开发环境和工具、制定研究、设计和开发计划、撰写开题报告、撰写毕业论文(学位论文)、参加答辩等环节,在老师的指导下,独立完成对问题的分析、求解(含设计和实现)和总结,最终完成经过审定的题目。

0006456 Graduation Project

Course Number: 0006456

Course Title: Graduation Project

Course Type: Compulsory practice course

Credit: 8.0 **Total Credit Hours:** 480

Students: Undergraduate students majoring in Digital Media Technology

Prerequisites:

Evaluation Method: Thesis + Defense

Writer: Zhu Wenzhe

Course Description:

Graduation Project is a compulsory practice course. The course task is to enable students to further master the basic knowledge, basic technology and basic methods of the major, comprehensively and flexibly use the basic theory and professional skills learned to solve practical problems of Digital Media Technology discipline and specialty, and experience the solution process of solving complex engineering problems, so as to get comprehensive training. During the graduation project period, students must independently complete the analysis, solution (including design and implementation) and summary of the problems through topics selection, paper reading, selection and use of development environment and tools, formulation of research, design and development plan, writing of opening report, writing of graduation thesis, participation in defense and so on, under the guidance of teachers, independently complete the problem analysis, solution (including design and implementation) and summary, and finally complete the approved topic. The key point is to make students participate in the whole process of solving engineering problems. The difficulty lies in the improvement of students' comprehensive ability.

0010084 动画影片创作

课程编码：0010084

课程名称：动画影片创作

英文名称：Animation Creation

课程类型：实践环节选修课

学分：2.0 **总学时：**60

面向对象：数字媒体技术专业本科生

先修课程：色彩学基础、草图与透视基础、数字摄影

考核形式：考察

课程简介：

“动画影片创作”位于第5学期，在数字媒体技术本科课程的中段，可以视为“动画基础”课程的实践环节。本课程置于色彩学基础、草图与透视基础、数字摄影、三维美术设计等课程之后。在这一系列课程中，学生积累视觉经验，掌握视觉作品生产技能，学习使用视听语言叙事、传达信息与情绪，为更复杂的交互产品创作提供理论和技能支持。另一方面，到“动画影片创作”为止，学生初步获得了试听语言叙事作品生产的能力，走完影视、动画创作的一般流程，在之后的学习工作中，通过有针对性的学习与探索，完成更加复杂的作品或工程。

推荐教材或主要参考书：

[1] [英] 理查德·威廉姆斯，原动画基础教程（第2版），中国青年出版社，2011.1

0010084 Animation Creation

Course Number: 0010084

Course Title: Animation Creation

Course Type: Elective course in practice

Credit: 2 **Total Credit Hours:** 60

Students: Undergraduate students majoring in Digital Media Technology

Prerequisites: Fundamentals of Chromatics, Fundamentals of Sketch and Perspective, Digital Photography

Evaluation Method: General Assessment

Writer: Li Weiran

Course Description:

" Animation Creation " is set up in the fifth semester, which can be considered as a practical part of the "Animation Fundamentals" course in the middle of the undergraduate course on digital media technology. This course is placed after courses such as Fundamentals of Colorology, Fundamentals of Sketching and Perspective, Digital Photography, and 3D Art Design. In this series of courses, students accumulate visual experience, master visual production skills, learn to use audio-visual language to narrate, convey information and emotions, and provide theoretical and technical support for more complex interactive product creation. On the other hand, by the time of 'animation film creation', students have initially acquired the ability to listen to language narrative works and complete the general process of film, television, and animation creation. In their subsequent learning work, through targeted learning and exploration, they can complete more complex works or projects.

Recommended Textbooks/References:

1. Richard Williams, Animator's Survival Kit (2nd Edition), China Youth Press, 2011.1

0010143 三维实时渲染美术资产设计

课程编码：0010143

课程名称：三维实时渲染美术资产设计

英文名称：Practice of 3D assets Art and Design for Realtime rendering

课程类型：实践环节选修课

学分：3.0 **总学时：**90

面向对象：数字媒体技术专业本科生

先修课程：三维美术设计基础

考核形式：大作业

撰写者：朱文哲

课程简介：

三维实时渲染美术资产设计是信息学部为数字媒体技术专业本科生开设的实践环节选修课。本课程属于游戏设计与开发系列课程，任务是使学生在掌握了三维美术设计基础的前提下，进一步深入学习用于三维实时渲染应用程序的三维美术数字内容的设计制作流程，理解和掌握三维美术资产设计和制作的流程和行业要求，掌握如何将概念设计转化为三维实时渲染应用程序（视频游戏或者虚拟现实等）实际可用的三维美术资产。

推荐教材或主要参考书：

无

0010143 Practice of Game Development Course Design

Course Number: 0010143

Course Title: Practice of 3D assets Art and Design for Realtime rendering

Course Type: Elective course in practice

Credit: 3.0 **Total Credit Hours:** 90

Students: Undergraduate students majoring in Digital Media Technology

Prerequisites: Practice of 3D Art and Design

Evaluation Method: Final Project

Writer: Zhu Wenzhe

Course Description:

Practice of 3D assets Art and Design for Realtime rendering is one of the Elective course in practice for undergraduate students Major in Digital Media Technology. This course belongs to the series of game design and development courses. Its task is to enable students to further study the design and production process of 3D art digital content for 3D real-time rendering applications on the basis of mastering the basics of 3D art design. It helps students understand and master the process and industry requirements of 3D art asset design and production, and learn how to transform concept designs into 3D art assets that can be actually used in 3D real-time rendering applications (such as video games or virtual reality, etc.).

Recommended Textbooks/References:

None

0008177 虚拟现实技术课设

课程编码: 0008177

课程名称: 虚拟现实技术课设

英文名称: Virtual Reality Development

课程类型: 实践环节选修课

学分: 2.0 **总学时:** 60

面向对象: 数字媒体技术专业本科生

先修课程: 计算机图形学, 高级语言程序设计, 面向对象程序设计 (C++)

考核形式: 平时成绩+ 考查

撰写者: 齐娜

课程介绍:

虚拟现实技术课设是实践环节选修课, 此课程要求学生掌握虚拟现实开发的基本原理, 概念, 方法。能够使用一款三维渲染引擎进行虚拟现实场景的制作, 了解虚拟现实开发的基本组成部分, 能够搭建一个专业的虚拟现实场景。了解虚拟现实的开发平台, 语言, 以及相关开发引擎的使用, 如使用 Unity 引擎进行相关的虚拟现实程序的编程性设计课程。此课程要求学生熟练掌握虚拟现实的场景搭建编程技术, 三维渲染技术, 以及交互技术编程。要求学生有较高的编程水平, 对 C++ 语言, C# 语言熟练掌握, 通过此课程, 学生能够对目前所用到的基本的虚拟现实相关的编程技术有初步的了解和掌握。培养数字媒体技术从业工作者所应具备的科学的工作方法、作风和相互合作的精神。知识包括虚拟现实项目需求分析中的功能要求、性能要求、用例等; 结合光照渲染、纹理映射、交互设计、碰撞检测、人机交互等在项目中完成交互设计与实现, 包括 VRTK 加载与安装、控制器按钮实践、控制激光指针、瞬间移动、控制器抓取, 使用与交互, 交互式 UI 元素等。

推荐教材或主要参考书:

- [1] 虚拟现实理论、技术、开发与应用, 吕云、王海泉、孙伟, 清华大学出版社, 2019 年
- [2] HTC Vive VR 游戏开发实战, 胡良云, 清华大学出版社, 2017

0008177 Virtual Reality Development

Course Number: 0008177

Course Title: Virtual Reality Development

Course Type: Elective course in practice

Credit: 2.0 **Total Credit Hours:** 60

Students: Undergraduate students majoring in Digital Media Technology

Prerequisites: Computer Graphics, Programming (C), Object-Oriented Programming (C++)

Evaluation Method: Course participation + Exams

Writer: Qi Na

Course Description:

Virtual reality technology course is an elective course in practice, which requires students to master the basic principles, concepts, and methods of virtual reality development, and can use a 3D rendering engine for virtual reality scene. This course aims to enable students understand the basic components of virtual reality development and build a professional virtual reality scene. This course requires students to learn about virtual reality development platforms, languages, and related development engines, such as programming design courses for related virtual reality programs using Unity engine. This course requires students to master virtual reality scenario-building programming techniques, 3D rendering techniques, and interactive programming. Students are required to have a high level of programming, proficiency in the C plus plus language and C# language. Through this course, students can have a preliminary understanding and mastery of using the basic virtual reality-related programming technology. This course aims to cultivate the scientific working methods, style, and spirit of cooperation that digital media technology workers should have. The basic topic includes requirement analysis with the functional requirements, performance requirements, and use cases. Based on the theory of lighting rendering, texture mapping, interaction design, collision detection, and human-computer interaction, the interaction design and implementation should be completed in the VR Project. The interaction design and implementation consist of VRTK package load and installation, controller button function, controller laser pointers, teleportation, controller grabbing, using and interaction, as well as interactive UI elements.

Recommended Textbooks/References:

1. Yun Lv, Haiquan Wang, Wei Sun, Introduction of Virtual Reality: Theory, Technology, Development, and Application, Tsinghua University Press, 2019
2. Liangyun Hu, HTC Vive VR Game development and Practice, Tsinghua University Press, 2017

0010125 移动应用开发设计与实践

课程编码：0010125

课程名称：移动应用开发设计与实践

英文名称：Mobile Application Development Design and Practice

课程类型：实践环节选修课

学分： 3.0 总学时： 90

面向对象：数字媒体技术专业本科生

先修课程：移动应用开发

考核形式：平时成绩+考查

课程简介：

“移动应用开发设计与实践”是数字媒体技术专业的一门实践环节选修课，技术性与实践性较强。该课程在整个教学培养方案中是属于数字媒体技术专业的中高级课程，是“移动应用开发”课程的重要实践环节，是将理论与实际联系的必要过程。本课程主要目的是配合课堂教学所讲授的知识内容，进行相应的实验性操作，使学生在完成实验项目的过程中，逐步加深对课堂讲授内容的认识，在理解和掌握移动应用开发相关知识与技术的基础上，能从需求出发、经过功能设计、原型、UI 设计、编程、测试到部署，完成一款移动应用，并学会撰写软件开发实践报告。最终通过项目开发实践，逐步具备软件调试、代码组织、Bug 跟踪，解决实际问题的基本技能，为后续工作实习、毕业设计等教学环节打下良好的基础。

推荐教材或主要参考书：

- [1] 郭霖 第一行代码 Android 第 3 版. 人民邮电出版社，2020.4
- [2] 王辰龙 高级 Android 开发强化实战. 电子工业出版社，2018.06
- [3][美]莫莉·马斯克里（Molly Maskrey）著，周庆成译 精通 iOS 开发第 8 版. 人民邮电出版社，2017.07
- [4] 微信公众平台 <https://mp.weixin.qq.com/>
- [5] 杜文 Flutter 实战. 机械工业出版社，2020.03
- [6] React 官网 <https://react.docschina.org/>
- [7] ThinkPHP 官网 <https://www.thinkphp.cn/>

0010125 Mobile Application Development Design and Practice

Course Number: 0010125

Course Title: Mobile Application Development Design and Practice

Course Type: Elective course in practice

Credit: 3.0 **Total Credit Hours:** 90

Students: Undergraduate students majoring in Digital media technology

Prerequisites: Mobile application development

Evaluation Method: Course participation + work test

Course Description:

"Mobile application development design and practice" is a practical elective course of digital media technology specialty, which is highly technical and practical. In the whole teaching and training program, this course is a medium and advanced course of digital media technology specialty. It is an important practical link of "mobile application development" course and a necessary process of connecting theory with practice. The main purpose of this course is to cooperate with the knowledge content taught in classroom teaching and carry out corresponding experimental operations, so that students can gradually deepen their understanding of classroom teaching content in the process of completing experimental projects. On the basis of understanding and mastering the knowledge and technology related to mobile application development, students can complete a mobile application from demand, through function design, prototype, UI design, programming, testing to deployment, and learn to write a software development practice report. Finally, through the project development practice, students can gradually have the basic skills of software debugging, code organization, bug tracking and solving practical problems, so as to lay a good foundation for subsequent work practice, graduation design and other teaching links.

Recommended Textbooks/References:

1. Guolin. First code Android(3rd). Posts and Telecommunications Press, 2020.4
2. Wangchenlong. Advanced Android development and enhanced practice. 2018.06
3. Molly Maskrey, Kim Topley, David Mark, Fredrik Olsson, Jeff LaMarche. Beginning iPhone Development with Swift 3. Posts and Telecommunications Press, 2017.07
4. <https://mp.weixin.qq.com/>
5. Duwen. Flutter practice. Machinery Industry Press, 2020.03
6. <https://react.docschina.org/>
7. <https://www.thinkphp.cn/>

0010150 游戏开发实践

课程编码: 0010150

课程名称: 游戏开发实践

英文名称: Practice of Game Development Course Design

课程类型: 实践环节选修课

学分: 3.0 **总学时:** 90

面向对象: 数字媒体技术专业本科生

先修课程: 线性代数（工）、数据结构与算法、计算机图形学、游戏开发技术基础

考核形式: 答辩

撰写者: 王泽

课程简介:

游戏开发实践是数字媒体技术专业实践环节选修课，技术性与实践性较强，是将理论与实际联系的必要过程。本实践环节的主要任务是让学生根据实验题目的要求，依据课堂讲授的相关知识，通过分析、设计、编程、调试等环节独立完成一个较大的实际应用项目，进而加深对游戏引擎、游戏开发相关概念的理解，以及关键技术的应用技巧，最终使学生具备利用计算机解决中等规模实际问题的能力。在这个实践过程中学生们熟悉了游戏软件开发的基本过程，初步掌握游戏软件开发过程各阶段的基本任务和技能方法；培养学生的算法设计和算法分析能力，提高综合运用所学的理论知识和方法独立分析和解决问题的能力；训练用系统的观点和游戏软件开发一般规范进行游戏软件开发，培养软件工作者所应具备的科学的工作方法、作风和相互合作的精神。

推荐教材或主要参考书:

[1] Jason Gregory . Game Engine Architect . 译: 叶劲峰 . 北京: 电子工业出版社 . 2014年1月出版

0010150 Practice of Game Development Course Design

Course Number: 0010150

Course Title: Practice of Game Development Course Design

Course Type: Elective course in practice

Credit: 3.0 **Total Credit Hours:** 90

Students: Undergraduate students majoring in Digital Media Technology

Prerequisites: Linear algebra, Data Structures and Algorithms, Computer Graphics, Fundamentals of game development technology

Evaluation Method: Defense

Writer: Wang Ze

Course Description:

Game Development Practice is a required course for the Digital Media Technology major, and it is highly technical and practical. It serves as a necessary link between theory and practice. The main objective of this practical component is to have students independently complete a substantial practical application project based on the requirements of the experimental topics and the relevant knowledge taught in class. This involves tasks such as analysis, design, programming, and debugging. Through this process, students deepen their understanding of game engines, game development concepts, and the application techniques of key technologies. Ultimately, it equips students with the ability to use computers to solve medium-sized practical problems. During this practice, students become familiar with the basic process of game software development, gaining initial mastery of the fundamental tasks and skills involved in various stages of game software development. It nurtures students' ability to design and analyze algorithms, enhances their capacity to independently analyze and solve problems by comprehensively applying the theoretical knowledge and methods they have learned. The practice also trains students to develop game software in accordance with established standards and norms, fostering a scientific work method, work ethic, and a spirit of collaboration that software professionals should possess."

Recommended Textbooks/References:

1. Jason Gregory . Game Engine Architect, 2014.1

0010148 视觉传达设计

课程编码: 0010148

课程名称: 视觉传达设计

英文名称: Visual Communication Design

课程类型: 专业选修课

学 分: 3.0 **总学时:** 48

面向对象: 数字媒体技术专业本科生

先修课程: 色彩学基础

考核形式: 平时成绩+期末作业

撰写人: 李宇彤

课程简介

视觉传达设计是指设计者利用平面视觉符号——文字、插图和标志，来传递给接受者各种信息的设计。“视觉传达设计”是数字媒体技术专业的专业选修课。课程从视觉生理与视觉心理入手，深入浅出的介绍视觉传达设计中的视觉设计规律、视觉表达方法、视觉设计色彩、设计技巧及行业规范。

教材及参考书:

[1]视觉传达设计 李鸿明, 赵天华主编. 电子科技大学出版社, 2016. 8 ISBN 9787564727277

[2]视觉传达设计 罗宾·兰达(美) 上海人民美术出版社 2019.4 ISBN: 9787558610493

0010148 Visual Communication Design

Course Number: 0010148

Course Title: Visual Communication Design

Course Type: Professional elective course

Credit: 3.0 **Total Credit Hours:** 48

Students: Undergraduate students majoring in Digital media technology

Prerequisites: Fundamentals of Chromatics

Evaluation Method: Course participation + Final assignment

Writer: Li Yutong

Course Description:

Visual communication design refers to the design that designers use graphic visual symbols - words, illustrations and signs to convey all kinds of information to recipients“ "Visual communication design" is a professional elective course of digital media technology specialty. Starting with visual physiology and visual psychology, the course introduces the visual design law, visual expression method, visual design color, design skills and industry norms in visual communication design in simple terms.

Recommended Textbooks/References:

1 Visual communication design, edited by Li Hongming and Zhao Tianhua, University of Electronic Science and Technology Press, August 2016, 1sbn 97875647277

2 Visual communication design Robin Landa (USA) Shanghai People's Art Publishing House, April 2019 ISBN: 9787558610493

0008158 算法设计与分析

课程编码: 0008158

课程名称: 算法设计与分析

英文名称: Design and Analysis of Algorithms

课程类型: 专业选修课

学分: 2.0 **总学时:** 32

面向对象: 数字媒体技术本科生

先修课程: 面向对象程序设计(C++)、离散数学、数据结构与算法

考核形式: 平时成绩+报告

撰写者: 梁培

课程简介:

《算法设计与分析》是数字媒体技术专业本科生的一门学科基础课。在计算机学科中,无论是软件设计、还是硬件设计都离不开算法,算法是计算机科学的核心。本课程为学生打开算法之门,介绍常用的算法设计策略和技术、众多经典问题及其算法设计思想、算法证明和分析的方法等,在解决实际问题时,对于较复杂的问题能抽象出问题的数学模型,设计出有效的算法。通过本课程的学习,学生能掌握分治算法、动态规划算法、贪心算法、回溯法和分支限界法的基本思想,提高学生设计和编写算法的能力、算法复杂度的分析能力以及算法改进的能力,最后可以使学生获得利用常见的算法设计方法来解决软件开发中的实际问题的技能。

推荐教材或主要参考书:

- [1] 屈婉玲, 刘田, 张立昂, 王捍贫, 《算法设计与分析》, 清华大学出版社, 2016 年
- [2] 王晓东, 《算法设计与分析》, 清华大学出版社, 2018 年
- [3] [美] Thomas H. Cormen, [美] Charles E. Leiserson, [美] Ronald L. Rivest, [美] Clifford Stein, 《算法导论 (原书第 3 版)》. 机械工业出版社, 2013 年.

0008158 Design and Analysis of Algorithms

Course Number: 0008158

Course Title: Design and Analysis of Algorithms

Course Type: Professional elective course

Credit: 2.0 **Total Credit Hours:** 32

Students: Undergraduate students majoring in Digital media technology

Prerequisites: Object oriented programming, discrete mathematics, data structure and algorithm

Evaluation Method: Course participation + Report

Writer: Liang Yu

Course Description:

Design and Analysis of Algorithms is a basic course for digital media technology undergraduates. In computer science, both software design and hardware design are inseparable from algorithms, which is the core of computer science. Students can gain access to the world of algorithms by taking this course, which covers the following topics: (1) common strategies and technologies for designing algorithms, (2) the algorithmic design approaches for many classic problems, (3) methods for analyzing and proving algorithms, and more. In solving practical problems, students can abstract the mathematical model of the problem for more complex problems and design effective algorithms. By studying this course, students can master the basic ideas of divide-and-conquer, dynamic programming, greedy, backtracking-branch bounds algorithms. This course improves students' ability to design and write algorithms, analyze algorithm complexity, and improve algorithms. Finally, it can also enable students to obtain the technology of using standard design methods to solve practical problems in software development.

Recommended Textbooks/References:

1. Qu Wanling, Liu Tian, Zhang Li'ang, Wang Hanpin, Design and Analysis of Algorithms, Tsinghua University Press, 2016.
2. Wang Xiaodong, Design and Analysis of Algorithms, Tsinghua University Press, 2018.
3. Thomas H.Cormen, Charles E.Leiserson, Ronald L.Rivest, Clifford Stein, Introduction to Algorithms, third edition, China Machine Press, 2013.

0010137 游戏开发技术基础

课程编码: 0010137

课程名称: 游戏开发技术基础

英文名称: Fundamentals of game development technology

课程类型: 专业选修课

学 分: 3.0 **总学时:** 48

面向对象: 数字媒体技术专业本科生

先修课程: 面向对象程序设计(C++)

考核形式: 平时成绩+期末作业

撰写人: 李宇彤

课程简介

“游戏开发技术基础”课程，要求学生通过对 Unity 游戏引擎的学习，掌握 3D 游戏开发的基本技术和流程，并能够对游戏制作的各个环节有初步了解；能够用 Unity3D 游戏引擎进行基础的游戏编程和开发，并能够独立实现一个基本三维游戏的游戏策划、场景建模、特效制作、UI 设计、交互设计及游戏发布完整过程。

教材及参考书:

[1] Unity 3D VR/AR 程序开发设计 作者李智艺；李楠 2018.10 北京理工大学出版社

0010137 Fundamentals of game development technology

Course Number: 0010137

Course Title: Fundamentals of game development technology

Course Type: Professional elective course

Credit: 3.0 **Total Credit Hours:** 48

Students: Undergraduate students majoring in Digital media technology

Prerequisites: Object-Oriented Programming (C++)

Evaluation Method: Course participation + Final assignment

Writer: Li Yutong

Course Description:

The course "Fundamentals of game development technology" requires students to master the basic technology and process of 3D game development through learning unity game engine, and have a preliminary understanding of all links of game production; Be able to use unity3d game engine for basic game programming and development, and independently realize the complete process of game planning, scene modeling, special effects production, UI design, interaction design and game release of a basic 3D game.

Recommended Textbooks/References:

1. Li Zhiyi, author of unity 3D VR / AR program development and design; Li Nan, October 2018, Beijing University of Technology Press

0007468 游戏引擎分析

课程编码: 0007468

课程名称: 游戏引擎分析

英文名称: Analysis of Game Engine

课程类型: 专业选修课

学分: 2.0 **总学时:** 32

面向对象: 数字媒体技术专业本科生

先修课程: 线性代数（工）、数据结构与算法、计算机图形学、游戏开发技术基础

撰写者: 王泽

考核形式: 大作业 + 答辩

课程简介:

游戏引擎指的是为游戏开发准备的一系列可视化开发工具和可重用组件。这些工具通过与开发环境进行集成，方便开发者简单、快速进行数据驱动方式的游戏开发。其目的在于让游戏设计者能容易和快速地做出游戏应用，从而无需从零开始实现每一个技术细节。游戏引擎被广泛应用于游戏开发、虚拟现实、富媒体交互等场景中。在具体的工作中，不光需要掌握游戏引擎的使用方法，更需要对其架构及原理进行深入理解，才能将其灵活运用及创新。本课程根据数字媒体技术专业“科学与艺术结合”的专业特色定位，并以此为基础构建内容框架，在课程设置过程中注重游戏引擎的工程性和实践性，选择渲染原理、游戏主循环、寻路算法、渲染架构、数据驱动开发、引擎编辑器开发作为主要知识点，密切结合游戏引擎的先进技术、最佳实践和案例分析，透彻讲解游戏引擎诸多模块，使学生在理解和实践的基础上掌握当前主流游戏引擎的架构设计原理与实现方式，并可以自己动手从零开始实现一款简单的游戏引擎。

推荐教材或主要参考书:

[1] Jason Gregory . Game Engine Architect . 译: 叶劲峰 . 北京: 电子工业出版社 . 2014 年 1 月出版

0007468 Analysis of Game Engine

Course Number: 0007468

Course Title: Analysis of Game Engine

Course Type: Professional elective course

Credit: 2.0 **Total Credit Hours:** 32

Students: Undergraduate students majoring in Digital Media Technology

Prerequisites: Linear algebra, Data Structures and Algorithms, Computer Graphics, Fundamentals of game development technology

Evaluation Method: Final Project + Defense

Writer: Wang Ze

Course Description:

Game engine refers to a set of visual development tools and reusable components prepared for game development. These tools are integrated with the development environment to facilitate developers in creating data-driven games quickly and easily. The goal is to enable game designers to create game applications easily and quickly without starting from scratch to implement every technical detail. Game engines are widely used in game development, virtual reality, rich media interaction, and other scenarios. In practical work, it is essential not only to master the use of game engines but also to have a deep understanding of their architecture and principles in order to flexibly apply and innovate them. This course is tailored to the unique characteristics of the Digital Media Technology major, emphasizing the integration of science and art. Based on this, the course framework focuses on the engineering and practical aspects of game engines. Key topics include rendering principles, game main loops, pathfinding algorithms, rendering architecture, data-driven development, and engine editor development. The course closely combines advanced technologies, best practices, and case studies related to game engines, providing in-depth explanations of various engine modules. This enables students to grasp the architectural design principles and implementation methods of mainstream game engines and empowers them to create a simple game engine from scratch through both understanding and hands-on practice.

Recommended Textbooks/References:

1. Jason Gregory. Game Engine Architect. Publishing House of Electronics Industry. January 2014

0008179 艺用解剖

课程编码: 0008179

课程名称: 艺用解剖

英文名称: Artistic Anatomy

课程类型: 专业选修课

学分: 2.0 **总学时:** 32

面向对象: 数字媒体技术专业本科生

先修课程: 色彩学基础、草图与透视基础、三维美术设计基础

考核形式: 考察

撰写者: 李蔚然

课程简介:

在数字媒体技术领域,不论是视觉艺术作品生产,还是对人类社会各领域的可视化研究,都依赖计算机图形技术对现实场景、人物的三维重建。艺用解剖课将带领学生深入了解人体组成与运动机理,训练手段是数字雕刻技术,核心技能是高精度建模。同时要求学生掌握快速三维创意表现,重新拓扑三维模型网格,获取UV与纹理,最终得到高精度人物模型,为游戏提供贴图素材,并为完成高质量动画打基础。艺用解剖的不同于医学解剖:只关注明显影响人体外观的身体组织结构。我们不要求学生达到艺术类绘画专业学生的解剖学知识水平,而是在有限的课时内使学生了解人体结构知识,掌握主要肌肉和骨骼的位置和附着关系、理解肌肉对骨骼的牵引作用以及不同姿态下的肌肉骨骼脂肪等组织对人体外观的影响。

推荐教材或主要参考书:

[1] [法]Fredreic Delavier. 肌肉健美训练图解. 山东科学技术出版社, 2010.7.2

[2] [美]Frank H. Netter. 奈特人体解剖学彩色图谱. 张卫光, 主译. 人民卫生出版社, 2015.1

[3] [美]艾略特·古德芬格. 牛津艺用人体解剖学(经典版).李慧娟, 译. 上海人民美术出版社, 2015.8

0008179 Artistic Anatomy

Course Number: 0008179

Course Title: Artistic Anatomy

Course Type: Professional elective course

Credit: 2.0 **Total Credit Hours:** 32

Students: Undergraduate students majoring in Digital Media Technology

Prerequisites: Fundamentals of Chromatics, Fundamentals of Sketch and Perspective, Practice of 3D Art and Design

Evaluation Method: General Assessment

Writer: Li Weiran

Course Description:

In the field of digital media technology, Visual art works and visualization research in various fields all rely on computer graphics technology to reconstruct the real scene and characters. The Artistic Anatomy course will lead students to deeply understand the composition and movement mechanism of human body. The training method is digital carving, and the core skill is high-precision modeling. At the same time, students are required to master the fast 3D creative performance, re topology the 3D model mesh, obtain UV and texture, and finally get the high-precision character model, provide mapping materials. It is the foundation for the high-quality animation and video game. Artistic anatomy is different from medical anatomy, this course only focuses on the body tissue structure that obviously affects the appearance of the human body. We do not require students to reach the level of art painting majors, but to enable students to understand the knowledge of human body structure, master the position and attachment relationship of main muscles and bones, understand the traction effect of muscles on bones, and the influence of muscle bone fat and other tissues on the appearance of human body in limited class hours.

Recommended Textbooks/References:

1. Fredreic Delavier, Stength Training Anatomy, Human Kinetics, 2010
2. Frank H. Netter. Atlas of Human Anatomy, People's Medical publishing House 2015.1
3. Eliot Goldfinger, Human Anatomy for Artists, Shanghai People's Fine Arts Publishing House, 2015.8

0001640 数字图像处理

课程编码: 0001640

课程名称: 数字图像处理

英文名称: Digital Image Processing

课程类型: 专业选修课

学分: 2.0 **总学时:** 32

面向对象: 数字媒体技术专业本科生

先修课程: 高等数学(工)、概率论与数理统计(工)、高级语言程序设计

考核形式: 平时成绩+考试

撰写人: 谢笑阳

课程简介:

数字图像处理是软件学院(部)为数字媒体技术专业本科生开设的专业选修课。本课程的任务是在加强数字图像处理基础理论学习的基础上,重点讲授空域滤波、频域滤波、图像编码与压缩、图像的特征等数字图像处理的经典领域及相关技术,并结合数字图像处理的应用一章,拓展对图像处理技术最新技术及典型应用的学习。教学内容重点:(1)图像、图像系统与视觉系统(2)空域滤波(3)频域滤波(4)图像压缩(5)图像特征(6)图像处理的应用。教学内容的难点:(1)图像的采样与量化(2)直方图处理与空间滤波器(3)图像傅里叶变换频谱分析(4)压缩编码方法(5)图像多尺度描述(6)图像处理技术新进展。

推荐教材或主要参考书:

- [1] 冈萨雷斯, 伍兹著, 阮秋琦等译, 数字图像处理(第三版), 电子工业出版社, 2011年6月
- [2] 冈萨雷斯, 伍兹著, 阮秋琦等译, 数字图像处理(MATLAB版)(第2版), 电子工业出版社, 2014年1月
- [3] Milan Sonka, Vaclav Hlavac, Roger Boyle 著, 图像处理、分析与机器视觉(第四版), 清华大学出版社, 2016年6月
- [4] Richard Szeliski 著, Computer Vision: Algorithms and Applications, Springer, 2010年10月
- [5] Ian, Goodfellow, Yoshua, Bengio, Aaron 著, 深度学习, 人民邮电出版社, 2017年8月

0001640 Digital Image Processing

Course Number: 0001640

Course Title: Digital Image Processing

Course Type: Professional elective course

Credit: 2.0 **Total Credit Hours:** 32

Students: Undergraduate students majoring in Digital Media Technology

Prerequisites: Advanced Mathematics (Engineering), Probability Theory and Mathematical Statistics (Engineering), High level language programming

Evaluation Method: Course participation + written exams

Writer: Xie Xiaoyang

Course Description:

Digital Image Processing is one of the elective courses for undergraduate students Major in Digital Media Technology. The main target of this course is to clarify the foundational theoretical knowledge of digital image processing. This course is focus on teaching classic areas and related techniques of digital image processing. The teaching contents are mainly covered by the following aspects: (1) Images, Image Systems, and Visual Systems; (2) Spatial Filtering; (3) Frequency Domain Filtering; (4) Image Compression; (5) Image Features; (6) Applications of Image Processing. The difficulties of teaching contents are described as followings: (1) Image Sampling and Quantization; (2) Histogram Processing and Spatial Filters; (3) Discrete Fourier Transform and Spectrum Analysis; (4) Compression and Coding Methods; (5) Multi-Scale Description of Images; (6) Recent Advances in Image Processing Techniques.

Recommended Textbooks/References:

- 1.Refael C. Goozalez, Richard E. Woods, Digital Image Processing (3th Edition), Electronic Industry Press, June 2011.
- 2.Electronic Industry Press, Jan. 2014.
- 3.Milan Sonka, Vaclav Hlavac, Roger Boyle, Image processing, Analysis and Machine vision (4th Edition), Tsinghua University Press, June, 2016
- 4.Richard Szeliski, Computer Vision: Algorithms and Applications, , Springer, Oct., 2010.
- 5.Ian, Goodfellow, Yoshua, Bengio, Aaron, Deep Learning, People's Post and Telecommunications Press, Aug., 2017.

0008404 机器学习与数据分析

课程编码: 0008404

课程名称: 机器学习与数据分析

英文名称: Machine Learning and Data Analysis

课程类型: 专业选修课

学分: 2.0 **总学时:** 32

面向对象: 数字媒体技术专业本科生

先修课程: 高等数学, 线性代数, 概率论与数理统计, 高级语言程序设计, 数据结构与算法

考核形式: 平时成绩+考试

撰写人: 丁兴建

课程简介: (250-300 字)

机器学习与数据分析是信息学院(部)为数字媒体技术专业本科生开设的专业选修课程类型。本课程的任务是通过对机器学习和数据分析的基本概念和算法的介绍,使得学生掌握机器学习的常用算法以及数据分析的主要方法,并掌握本领域主流的编程语言和工具包的使用。教学内容重点包括:机器学习基本概念,机器学习算法性能的度量,线性回归, logistic 回归,神经网络,支持向量机,决策树算法,贝叶斯分类,聚类算法,数据降维算法,本领域前沿研究介绍。教学内容的难点包括:神经网络的反向传播算法,支持向量机算法,数据降维的主成分分析算法。

推荐教材或主要参考书:

- [1] 周志华, 机器学习, 清华大学出版社, 2016 年 1 月
- [2] 李航, 统计学习方法(第 2 版), 清华大学出版社, 2019 年 5 月
- [3] 邱锡鹏, 神经网络与深度学习, 机械工业出版社, 2020 年 4 月
- [4] 斯坦福大学网络公开课“机器学习”课程讲义
- [5] Peter Harrington 等, 机器学习实战, 人民邮电出版社, 2015 年 7 月

0008404 Machine Learning and Data Analysis

Course Number: 0008404

Course Title: Machine Learning and Data Analysis

Course Type: Elective Course

Credit: 2.0 **Total Credit Hours:** 32

Students: Undergraduate students majoring in Digital Media Technology

Prerequisites: Advanced mathematics, Linear Algebra, Probability theory, High-level language Programming, Data Structure and Algorithm

Evaluation Method: Course participation + written exams

Writer: Xingjian Ding

Course Description:

Machine Learning and Data Analysis is one of the elective courses for undergraduate students Major in Digital Media Technology. The main target of this course is to clarify the basic concepts and algorithms in machine learning and data analysis and enable students to master the usage of mainstream programming language and toolbox. This course is focus on machine learning algorithms. The teaching contents are mainly covered by the following aspects: Basic concepts of machine learning, Measurement of machine learning algorithm performance, Linear Regression, Logistic Regression, neural network, support vector machine, decision tree, Bayesian classification, Clustering, Dimension reduction, and an introduction of cutting-edge research in this field. The difficulties of teaching contents are described as followings: Back propaganda algorithm of the neural network, support vector machine, principle component analysis algorithm.

Recommended Textbooks/References:

1. Zhou Zhihua, Machine Learning, *Tsinghua university Press*, January-2016
2. Li Hang, Statistical Learning Methods, *Tsinghua university Press*, May-2019
3. Qiu Xipeng, Neural Networks and Deep Learning, *China Machine Press*, April-2020
4. Stanford University Open Online Course "Machine Learning" Course Notes
Peter Harrington, Machine Learning in Action, *Posts&Telecom Press*, July-2015

0010533 深度学习技术

课程编码: 0010533

课程名称: 深度学习技术

英文名称: Deep Learning Technologies

课程类型: 专业选修课

学分: 2.0 **总学时:** 32

面向对象: 数字媒体技术本科生

先修课程: 线性代数、概率论与数理统计（工）、数据结构与算法

考核形式: 平时成绩+期末大作业

撰写人: 奉雨娟

课程简介:

深度学习技术是信息学部为数字媒体技术专业本科生开设的一门专业选修课程。本课程的任务是让学生了解和理解深度学习的发展以及基础理论、重要模型、高效算法和技术应用。本课程注重培养学生运用深度学习技术解决实际问题的能力。通过项目展示与研讨，培养学生团队合作和有效沟通的能力。本课程将从基本原理、经典模型、高效算法、技术应用等多个层面介绍深度学习技术，教学内容重点包括：深度学习基础、线性模型、前馈网络、卷积网络、优化算法、循环网络和深度学习应用等。教学内容的难点包括卷积网络、优化算法和循环网络等。

推荐教材或主要参考书:

- [1] Ian Goodfellow, Yoshua Bengio and Aaron Courville. Deep Learning[M]. MIT Press, 2016.
- [2] 邱锡鹏. 神经网络与深度学习. 机械工业出版社, <https://nndl.github.io/>, 2021年10月.
- [3] Aston Zhang, Zachary C. Lipton, Mu Li and Alexander J. Smola. Dive into Deep Learning. <http://d2l.ai/>, 2021.06.
- [4] 周志华. 机器学习[M]. 清华大学出版社, 2016年1月.

0010533 Deep Learning Technologies

Course Number: 00101533

Course Title: Deep Learning Technologies

Course Type: Optional Specialized Courses

Credit: 2.0 **Total Credit Hours:** 32

Students: Undergraduate students majoring in Digital Media Technology

Prerequisites: Linear Algebra, Probability and Mathematical Statistics, Data Structures and Algorithms

Evaluation Method: Course participation + final project

Writer: Yujuan Feng

Course Description:

Deep Learning is one of the optional specialized courses for undergraduate students majoring in digital media technologies. The main target of this course is to enable students to know the development of deep learning and understand its basic theories, important models, efficient algorithms and applications. This course is focused on cultivating the students' ability to apply deep learning technologies to practical problems, as well as the ability of teamwork and effective communication through presentations and seminars. This course will introduce deep learning technologies from several perspectives, including basic principles, classical models, efficient algorithms and technical applications. The teaching contents are mainly covered by the following aspects: deep learning basics, linear models, feed-forward networks, convolutional networks, optimization algorithms, recurrent networks and deep learning applications. The difficulties of teaching contents are described as follows: convolutional networks, recurrent networks and optimization algorithms.

Recommended Textbooks/References:

3. Ian Goodfellow, Yoshua Bengio and Aaron Courville, Deep Learning[M], MIT Press, 2016
4. Xipeng Qiu, Neural networks and deep learning, China Machine Press, <https://nndl.github.io/>, 10-2021
5. Aston Zhang, Zachary C. Lipton, Mu Li and Alexander J. Smola, Dive into Deep Learning, <http://d2l.ai/>, 06-2021

Zhihua Zhou, Machine learning, Tsinghua University Press, 01-2016

0008173 虚拟现实技术

课程编码: 0008173

课程名称: 虚拟现实技术

英文名称: Virtual Reality Technology

课程类型: 专业选修课

学分: 2.0 **总学时:** 32

面向对象: 数字媒体技术专业本科生

先修课程: 计算机图形学, 高级语言程序设计, 面向对象程序设计 (C++)

考核形式: 平时成绩+考查

撰写者: 齐娜

课程简介:

本课程是数字媒体技术专业的一门专业选修课, 是数字媒体技术专业的核心课程之一。通过本课程, 使学生掌握虚拟现实技术的基本原理、基本方法; 熟悉虚拟现实交互设备和系统; 掌握虚拟场景和对象的建模方法, 并掌握光照渲染、纹理映射、深度感知、立体显示、交互设计、碰撞检测、人机交互等技术。培养综合运用编程理论、3D 建模, 设计并实现虚拟现实交互软件的能力, 获得实际开发经验; 同时掌握使用虚拟现实技术进行开发, 能够使用主流技术来进行虚拟现实的开发和制作, 能够掌握虚拟现实的基本组成部分和模块, 并最终能够开发出一个具体的虚拟现实的应用。

推荐教材或主要参考书:

- [1] [美] Grigore C. Burdea, [法] Philippe Coiffet 著. 魏迎梅等译, 虚拟现实技术(第二版), 2005.7.
- [2] 虚拟现实理论、技术、开发与应用, 吕云、王海泉、孙伟, 清华大学出版社, 2019 年
- [3] 虚拟现实技术, 刘光然主编, 清华大学出版社, 2011.1.
- [4] 虚拟现实与增强现实技术概论, 娄岩, 清华大学出版社, 2016
- [5] 虚拟现实技术基础教程, 喻晓和, 清华大学出版社, 2017 年
- [6] 虚拟现实与增强现实技术导论, 娄岩, 科学出版社, 2017 年
- [7] Steven M. LaValle, Virtual Reality, Cambridge University Press. 2020, <http://lavalle.pl/vr>

0008173 Virtual Reality Technology

Course Number: 0008173

Course Title: Virtual Reality Technology

Course Type: Professional elective course

Credit: 2.0 **Total Credit Hours:** 32

Students: Undergraduate students majoring in Digital Media Technology

Prerequisites: Computer Graphics, Programming (C), Object-Oriented Programming (C++)

Evaluation Method: Course participation + Exams

Writer: Qi Na

Course Description:

This course is a professional elective course and one of the core courses of digital media technology. Through this course, students can master the basic principles and methods of virtual reality technology, be familiar with virtual reality interactive devices and systems, master the modeling methods of virtual scenes and objects, and master lighting rendering, texture mapping, depth perception, stereo rendering, interaction design, collision detection, human-computer interaction as well as other technologies. This course aims to cultivate the ability of using programming theory, 3D modeling, design and realize virtual reality interactive software to gain practical development experience. After this course, students can master the development using virtual reality technology, use mainstream technology to develop and realize virtual reality, master the basic components and modules of virtual reality, and finally can develop a specific virtual reality application.

Recommended Textbooks/References:

1. Grigore C.Burdea, Philippe Coiffe, Virtual Reality (2nd Edition), July 2005.
2. Guanran Liu, Virtual Reality, Tsinghua University Press, Jan., 2011
3. Yan Lv, An introduction to virtual reality and augmented reality technology, Tsinghua University Press, 2016
4. Xiaohe Yu, Basic tutorial on virtual reality technology, Tsinghua University Press, 2017
5. Yan Lv, Introduction of Virtual Reality and Augmented Reality, Science Press, 2017
6. Steven M. LaValle, Virtual Reality, Cambridge University Press. 2016, <http://vr.cs.uiuc.edu/>

0008410 三维计算机图形学及 3D 技术

课程编码：0008410

课程名称：三维计算机图形学及 3D 技术

英文名称：3D Computer Graphics & 3D Technologies

课程类型：专业选修课

学分： 2.0 总学时： 32

面向对象：数字媒体技术专业本科生

先修课程：计算机图形学、面向对象程序设计（C++）、数据结构与算法

考核形式：平时成绩+考试

撰写者：王瑾

课程简介：

三维计算机图形学及 3D 技术既有图形数据结构、图形算法和图形语言方面的基础理论，又有 3D 立体显示、3D 扫描和 3D 成像等的先进技术，而且能在限定的实验规模下加以实现，是理论与实践密切相结合的重要学科基础课程之一。其应用十分广泛、发展极其迅速。本课程依据数字媒体技术专业学生的特点，结合应用实例和学科发展前沿讲授三维图形学的理论、算法与编程，使学生易于学习、加深对课程的理解，并引导出最新发展的各种 3D 技术及其在科研、工业、艺术、娱乐等领域中的应用。

推荐教材或主要参考书：

- [1]黄华，张磊编著，现代计算机图形学基础，北京：清华大学出版社，2020 年 5 月。
- [2]苏鸿根，计算机图形学及其 3D 技术，北京：清华大学出版社，2016 年 12 月（计划）。注：附带光盘包括部分彩色插图、实例程序源代码及说明、3D 软件与工具、参考资料等
- [3]苏鸿根，计算机图形学和 OpenGL for Windows 编程(修订本)，中国科学院研究生院讲义，北京 2005 年 9 月。注：教学参考资料在校内教学网站下载
- [4]Donald Hearn & M. Pauline Baker, Computer Graphics, PRENTICE HALL. 注：①中译本《计算机图形学(第二版)》，电子工业出版社，2002.5。②影印本《Computer Graphics with OpenGL, Third Edition》，清华大学出版社，2004.3
- [5]Morgan Kaufmann, Point-Based Graphics(基于点的图形学), Morgan Kaufmann publisher, 552 pages, ISBN:0123706041（电子文档）。
- [6]王琼华，3D 显示技术与器件，北京：科学出版社，2011 年 4 月
- [7]Brian Evans(美)著、程晨译，解析 3D 打印机：3D 打印机的科学与艺术，北京：机械工业出版社，2013 年 11 月

0008410 3D Computer Graphics & 3D Technologies

Course Number: 0008410

Course Title: 3D Computer Graphics & 3D Technologies

Course Type: Professional elective course

Credit: 2.0 **Total Credit Hours:** 32

Students: Undergraduate students majoring in Digital media technology

Prerequisites: Computer Graphics, Object-Oriented Programming (C++), Data Structures and Algorithms

Evaluation Method: Course participation + written exams

Writer: Wang Jin

Course Description:

3D computer graphics and 3D technology not only have the basic theories of graphics data structure, graphics algorithm and graphics language, but also have advanced technologies such as 3D stereoscopic display, 3D scanning and 3D imaging, which can be realized under the limited experimental scale. It is one of the important basic courses of the close combination of theory and practice. It is widely used and develops rapidly. Based on the characteristics of students majoring in digital media technology, combined with application examples and the forefront of discipline development, this course teaches the theory, algorithm and programming of 3D graphics, makes it easy for students to learn and deepen their understanding of the course, and guides the latest 3D technologies and their applications in scientific research, industry, art, entertainment and other fields.

Recommended Textbooks/References:

1. Huang Hua, Zhang Lei, Fundamentals of modern computer graphics, Tsinghua University Press, May, 2020
2. Su Honggen, Computer graphics and 3D technology, Tsinghua University Press, December, 2016
3. Su Honggen, Computer graphics and OpenGL for Windows programming, Lecture notes of Graduate School of Chinese Academy of Sciences, September, 2005
4. Donald Hearn & M. Pauline Baker, Computer Graphics, PRENTICE HALL.
5. Morgan Kaufmann, Point-Based Graphics, Morgan Kaufmann publisher.
6. Wang Qionghua, 3D display technology and devices, Science Press, April, 2011
7. Brian Evans, Practical 3D Printers: The Science and Art of 3D Printing, Machinery Industry Press, November, 2013

0010660 移动应用开发

课程编码: 0010660

课程名称: 移动应用开发

英文名称: Mobile Application Development

课程类型: 专业选修课

学分: 2.0 **总学时:** 32

面向对象: 数字媒体技术专业本科生

先修课程: 面向对象程序设计 (C++), Java 程序设计 (自学)

考核形式: 平时成绩+考查

撰写人: 王志强

课程简介:

本课程按照“2020 版北京工业大学数字媒体技术专业本科培养方案”要求,并以此为基础构建内容框架,在课程设置过程中注重移动应用开发的理论性和实践性。以当前流行的 Kotlin/Java、Swift/Object-C、Vue/React、ThinkJS、Electron、面向对象程序设计(ORP)和面向切片编程(AOP)为核心,以“Android”,“iOS”,“微信小程序”,“微信公众号”,“Electron”,“单页面”,“ThinkJS 后端服务器”为主要知识点要求,密切结合软件开发的先进技术、最佳实践和案例分析,透彻讲解移动应用开发的“知识体系”,“进阶路径”,“重点模块”,使学生在理解理论的基础上,结合“移动应用开发设计与实践”,掌握当前移动应用开发的方法、技术和工具。

推荐教材或主要参考书:

- [1] 郭霖 第一行代码 Android 第3版. 人民邮电出版社, 2020.4
- [2] 王辰龙 高级 Android 开发强化实战. 电子工业出版社, 2018.06
- [3] [美]莫莉·马斯克里 (Molly Maskrey) 著, 周庆成译 精通 iOS 开发第8版. 人民邮电出版社, 2017.07
- [4] 微信公众平台 <https://mp.weixin.qq.com/>
- [5] 杜文 Flutter 实战. 机械工业出版社, 2020.03
- [6] React 官网 <https://react.docschina.org/>
- [7] ThinkPHP 官网 <https://www.thinkphp.cn/>

0010660 Mobile Application Development

Course Number: 0010660

Course Title: Mobile Application Development

Course Type: Professional elective course

Credit: 2.0 **Total Credit Hours:** 32

Students: Undergraduate students majoring in Digital media technology

Prerequisites: Object-Oriented Programming (C++), Java Programming

Evaluation Method: Course participation + work test

Writer: Wang Zhiqiang

Course Description:

This course is designed in accordance with the requirements of the "2020 Version of the Undergraduate Training Program for Digital Media Technology at Beijing University of Technology." It is structured based on this foundation with a focus on the theoretical and practical aspects of mobile application development. The core technologies covered in the course include Kotlin/Java, Swift/Object-C, Vue/React, ThinkJS, Electron, Object-Oriented Programming (ORP), and Aspect-Oriented Programming (AOP). The primary knowledge points revolve around "Android," "iOS," "WeChat Mini Programs," "WeChat Official Accounts," "Electron," "Single Page," and "ThinkJS Back-End Servers." The course closely integrates advanced technologies, best practices, and case studies in software development to comprehensively explain the "knowledge system," "advanced path," and "key modules" of mobile application development. This approach enables students to understand the theory and, in conjunction with "Mobile Application Development Design and Practice," master the methods, technologies, and tools used in current mobile application development.

Recommended Textbooks/References:

1. Guolin. First code Android(3rd). Posts and Telecommunications Press, 2020.4
2. Wangchenlong. Advanced Android development and enhanced practice. 电子工业出版社, 2018.06
3. Molly Maskrey, Kim Topley, David Mark, Fredrik Olsson, Jeff LaMarche. Beginning iPhone Development with Swift 3. Posts and Telecommunications Press, 2017.07
4. <https://mp.weixin.qq.com/>
5. Duwen. Flutter practice. Machinery Industry Press, 2020.03
6. <https://react.docschina.org/>
7. <https://www.thinkphp.cn/>

0010142 三维模型制作

课程编码: 0010142

课程名称: 三维模型制作

英文名称: 3D model design

课程类型: 专业选修课

学 分: 2.0

总学时: 32

面向对象: 数字媒体技术专业本科生

先修课程: 无

考核形式: 平时成绩+期末作业

撰写人: 李宇彤

课程简介

三维模型制作课程，既可以作为专业基础课程，为后续的虚拟现实、动画实训、影视后期合成设计等专业课程服务，奠定三维造型制作基础；又可以作为独立专业课程对接就业岗位需求。课程以三维建模方法为切入点，由浅入深详细介绍了三维模型的创建方法、材质设置、灯光和渲染输出的建模全过程。

教材及参考书:

[1] 王玉梅 王梅君. 3ds Max+Vray 效果图设计完全学习手册. 新视角文化行 人民邮电出版社 2013.5

0010142 3D model design

Course Number: 0010142

Course Title: 3D model design

Course Type: Professional elective course

Credit: 2.0 **Total Credit Hours:** 32

Students: Undergraduate students majoring in Digital media technology

Prerequisites: None

Evaluation Method: Course participation + Final assignment

Writer: Li Yutong

Course Description:

The three-dimensional model making course can be used as a professional basic course to serve the follow-up professional courses such as virtual reality, animation training, film and television post synthesis design, and lay the foundation for three-dimensional modeling production; It can also be used as an independent professional course to meet the needs of employment. Taking the 3D modeling method as the starting point, the course introduces in detail the creation method of 3D model, material setting, lighting and the whole process of rendering output modeling from shallow to deep.

Recommended Textbooks/References:

1. Wang Yumei, Wang Meijun. Complete learning manual for 3DS MAX + Vray rendering design. New perspective culture bank. People's Posts and Telecommunications Press, may 2013

0010092 高级游戏引擎应用

课程编码: 0010092

课程名称: 高级游戏引擎应用

英文名称: Application of Unreal engine

课程类型: 专业选修课

学分: 2.0 **总学时:** 32

面向对象: 数字媒体技术专业本科生

先修课程: 动画基础, 三维美术设计基础

考核形式: 平时成绩+作业

撰写者: 宋邵乐

课程简介:

本课程依据数字媒体技术专业培养方案设计和要求, 依据学科知识框架, 结合工业界应用规范, 在课程设置中关注数字媒体技术理论与实际的关联性, 培养学生的工程实践能力。本课程以程序蓝图设计、高级美术资源制作和两者之间的交互为讲解核心, 以“蓝图程序原型设计”、“虚拟环境设计和实现”、“高级美术素材制作”、“游戏 AI”、“人机交互界面”、“数据驱动和游戏策划”为主要知识点要求, 基于 Unreal 游戏引擎针对具体案例进行深入分析解读, 阐明案例的设计思路和实现方法, 力求让学生结合理论, 了解原理, 着手实践, 举一反三。

推荐教材或主要参考书:

[1] Unreal 引擎官方文档

[2] 《大象无形: 虚幻引擎程序设计浅析》 中国工信出版集团 2017.5

0010092 Application of Unreal engine

Course Number: 0010092

Course Title: Application of Unreal engine

Course Type: Professional elective course

Credit: 2.0 **Total Credit Hours:** 32

Students: Undergraduate students majoring in Digital Media Technology

Prerequisites: The Basis of Animation, Practice of 3D Art and Design

Evaluation Method: Course participation + works

Writer: Song Shaoyue

Course Description:

This course is based on the design and requirements of the digital media technology professional training program, based on the subject knowledge framework, combined with industrial application specifications, and focuses on the relationship between digital media technology theory and practice in the curriculum setting, and cultivates students' engineering practice capabilities. This course focuses on program blueprint design, advanced art resource production and the interaction between them, with "blueprint program prototyping", "virtual environment design and implementation", "advanced art material production", "game AI", "Human-computer interaction interface" and "data-driven and game planning" are the main knowledge requirements. Based on the Unreal game engine, we conduct in-depth analysis and interpretation of specific cases, clarify the design ideas and implementation methods of the cases, and strive to enable students to combine theories and understand the principles.

Recommended Textbooks/References:

1. Unreal official Documents
2. Daxiang Wuxing: Analysis of Unreal Engine Program Design. China Industry and Information Technology Publishing Group 2017.5

0010134 影视后期合成

课程编码：0010134

课程名称：影视后期合成

英文名称：Film and Television Post Synthesis

课程类型：专业选修课

学 分：2.0

总学时： 32

面向对象：数字媒体技术专业本科生

先修课程：无

考核形式：平时成绩+期末作业

撰写者：李宇彤

课程简介

影视媒体已经成为当前最为大众化，最具影响力的媒体形式。从好莱坞大片所创造的幻想世界，到电视新闻所关注的现实生活，再到铺天盖地的电视广告，无一不深刻地影响着我们的生活。《影视后期合成》是数字媒体、影视动画等专业的主要专业课之一。本课程以专业的视频非线性编辑及后期合成软件 After Effects 为载体；以流行的典型案例为抓手；以精准的实训题目为平台；由浅入深的介绍视频采集/剪辑、遮罩应用、视频抠像、动画控制、特效合成与渲染输出全过程；并实时介绍行业规范与职业道德，让学生在掌握视频合成技术、工作流程的同时潜移默化的受到行业规范与职业道德的熏陶，做到润物无声。

教材及参考书：

- [1] 唯美世界. After EffectsCC 从入门到精通. 中国水利水电出版社, 2019.11
- [2] [美] Todd DeBreceni. 写给未来的电影人:特效化妆. 人民邮电出版社, 2014.08.01
- [3] [美] Trish Chris Meyer 著. 深度解析 After Effects. 人民邮电出版社, 2014.03.01
- [4] 新视角文化行. PremierePro CC 视频编辑剪辑制作完美风暴. 人民邮电出版社, 2014.09.01
- [5] 王鸿海, 李金辉. 电影视觉特效的数字制作. 中国电影出版社, 2014.09.01

0010134 Film and Television Post Synthesis

Course Number: 0010134

Course Title: Film and Television Post Synthesis

Course Type: Professional elective course

Credit: 2.0 **Total Credit Hours:** 32

Students: Undergraduate students majoring in Digital media technology

Prerequisites: None

Evaluation Method: Course participation + Final assignment

Writer: Li Yutong

Course Description:

Film and television media has become the most popular and influential media form at present. From the fantasy world created by Hollywood blockbusters, to the real life concerned by TV news, to the overwhelming TV advertising, all have a profound impact on our life. Film and television post synthesis is one of the main professional courses for digital media, film and television animation and other majors. This course takes the professional video non-linear editing and post synthesis software after effects as the carrier; Take popular typical cases as the starting point; Take accurate training topics as the platform; Introduce the whole process of video capture / editing, mask application, video matting, animation control, special effect synthesis and rendering output from simple to deep; It also introduces the industry norms and professional ethics in real time, so that students can be imperceptibly influenced by the industry norms and professional ethics while mastering the video synthesis technology and workflow, so as to moisten things silently.

Recommended Textbooks/References:

1. Aesthetic world. After effects from introduction to mastery. China water resources and Hydropower Press, November 2019
2. [US] Todd Debreceni. For future Filmmakers: special effects makeup. People's Posts and Telecommunications Press, August 1, 2014
3. [US] Trish Chris Meyer. In depth analysis of after effects. People's Posts and Telecommunications Press, March 1, 2014
4. New perspective culture line. Perfect storm of premierepro CC video editing and editing. People's Posts and Telecommunications Press, September 1, 2014
5. Wang Honghai, Li Jinhui. Digital production of film visual effects. China Film Press, September 1, 2014

0009394 新生研讨课

课程编码：0009394

课程名称：新生研讨课

英文名称：Freshman Seminar

课程类型：自主课程

学分：1.0 **总学时：**16

面向对象：数字媒体技术专业本科生

先修课程：无

考核形式：课程报告

撰写者：朱青

课程简介：

本课程是本专业的入门课程。本课程授课的目的是使学生了解数字媒体技术的基本概念和应用，了解本专业的培养目标及其毕业要求。通过学习本课程，学生可以了解数字媒体技术的发展过程、数字影视、数字娱乐、计算机图形学、数字图像处理等的基本内容和基本概念、发展和应用，以及相关企业的创业及人才需求；该课程通过讲授以及师生互动研讨，让学生了解数字媒体技术在现代社会和生活中的重要性，提升学生在数字媒体技术及其应用软件开发的学习兴趣，指导学生掌握在数字媒体技术上的正确学习方法。

推荐教材或主要参考书：

无

0009394 Freshman Seminar

Course Number: 0009394

Course Title: Freshman Seminar

Course Type: School-based course

Credit: 1.0 **Total Credit Hours:** 16

Students: Undergraduate students majoring in Digital Media Technology

Prerequisites: None

Evaluation Method: Report

Writer: Zhu Qing

Course Description:

This course is an introduction to the major. The purpose of this course is to enable students to understand the basic concepts and applications of digital media technology, and to understand the training goals and graduation requirements of the major. By studying this course, students can understand the development process of digital media technology, the basic content and basic concepts, development and application of digital film and television, digital entertainment, computer graphics, digital image processing, etc., as well as the entrepreneurial and talent needs of related enterprises; the Through lectures and interactive discussions between teachers and students, the course allows students to understand the importance of digital media technology in modern society and life, enhances students' interest in the development of digital media technology and its application software, and guides students in the correctness of digital media technology study method.

Recommended Textbooks/References:

None

0010663 学术写作课程

课程编码: 0010663

课程名称: 学术写作课程

英文名称: Academic Writing

课程类型: 自主课程

学分: 1.0

总学时: 16

面向对象: 数字媒体技术专业本科生

先修课程: 无

考核形式: 平时成绩+大作业

撰写者: 王瑾

课程简介:

学术写作是以研究科学和技术为主要内容的写作理论与方法, 探索科技事物的表达规律与技巧的学科。学术写作贯穿于科学技术研究工作的全过程, 是从事科学技术研究工作的专业技术人员必备的一项基本功, 也是必备的基本能力。通过对科技论文的概念、学位论文编写格式、学术论文编写格式、科技论文写作指南和写作规范等方面的讲授, 使学生了解科技论文写作的基本内容, 掌握科技论文写作的基本方法, 熟悉科技论文写作的基本规范, 为后续将自己的研究成果写作成符合科技写作要求的和高质量的科技论文打下良好的基础。

推荐教材或主要参考书:

[1] 姚养无编著. 科技论文写作基础. 国防工业出版社, 2017年4月

[2] Barbara Gastel、Robert A. Day 著, 任治刚译. 科技论文写作与发表教程(第八版). 电子工业出版社, 2018年1月

[3] 刘振海、刘永新、陈忠财、臧庆军、李桃编著. 中英文科技论文写作教程. 高等教育出版社, 2007年9月

0010663 Academic Writing

Course Number: 0010663

Course Title: Academic Writing

Course Type: school-based course

Credit: 1.0 **Total Credit Hours:** 16

Students: Undergraduate students majoring in Software Engineering

Prerequisites:

Evaluation Method: Course participation + Assignment

Writer: Wang Jin

Course Description:

Academic writing is a discipline that studies the writing theory and methods with science and technology as the main content, and explores the expression rules and techniques in the field of science and technology. Academic writing runs through the entire process of scientific and technological research work. It is a basic skill necessary for professional and technical personnel engaged in scientific and technological research, and it is also a necessary basic ability. Through lectures on the concept of scientific papers, dissertation writing format, academic paper writing format, a guide to write scientific papers and other writing norms and aspects, students will be familiar with scientific papers can understand the basic content of scientific paper writing and master the basic methods of scientific paper writing. The basic norms of writing lay a good foundation for the subsequent writing of one's own research results into high-quality scientific and technological papers that meet the requirements of scientific and technological writing.

Recommended Textbooks/References:

1. Yao Yangwu, Fundamentals of scientific and technological paper writing, National Defense Industry Press, 2017.4
2. Barbara Gastel, Robert A. Day, How To Write And Publish A Scientific Paper, 8th Edition, Publishing House of Electronics Industry, 2018.1
3. Liu Zhenhai, Liu Yongxin, Chen Zhongcai, Zang Qingjun, Li Tao, A course for writing Chinese and English scientific papers, Higher education press, 2007.9

0010719 学术前沿课程

课程编码: 0010719

课程名称: 学术前沿课程

英文名称: Academic Frontiers

课程类型: 自主课程

学分: 1.0 **总学时:** 16

面向对象: 数字媒体技术专业本科生

先修课程: 无

考核形式: 平时成绩+报告成绩

撰写者: 王瑾

课程简介:

本课程旨在引导学生关注本学科的发展前沿,了解相关科学技术的前沿知识,拓宽学术视野,同时培养创新性思维,提高逻辑分析能力和解决问题的能力。本课程主要介绍数字媒体技术领域的各个分支方向,深入介绍每个方向的前沿理论和前沿工作,重点涉及数字图像处理、计算机视觉技术、三维图形学、人工智能、游戏引擎、机器学习、通信技术与智能媒体、工程问题等方向的前沿技术。具体教学内容的重点和难点会根据本学科前沿科学研究的发展而做出相应的调整。

推荐教材或主要参考书:

无

0010719 Academic Frontiers

Course Number: 0010719

Course Title: Academic Frontiers

Course Type: School-based course

Credit: 1.0 **Total Credit Hours:**16

Students: Undergraduate students majoring in Software Engineering

Prerequisites:

Evaluation Method: Course participation + Report

Writer: Wang Jin

Course Description:

This course aims to guide students to pay attention to the frontiers of the development of this subject, understand the knowledge of related science and technology, broaden their academic horizons, cultivate innovative thinking, improve logical analysis and problem-solving skills. This course mainly introduces various branch directions in the field of digital media technology, in-depth introduction to the cutting-edge theory and work in each direction. In this course the main focus is on cutting-edge technologies in digital image processing, computer vision technology, three-dimensional graphics, artificial intelligence, game engines, machine learning, frontier technologies in communication technology and smart media, engineering issues, etc. The key points and difficulties of the specific teaching content will be adjusted accordingly according to the development of the frontier scientific research of the subject.

Recommended Textbooks/References:

None