# 《计算机文化（双语）》本科课程教学大纲

一、课程基本信息

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| 课程名称 | 计算机文化 |
| New Perspectives on Computer Concepts |
| 课程代码 | 2150006 | 课程学分 | 3 |
| 课程学时  | 48 | 理论学时 | 16 | 实践学时 | 32 |
| 开课学院 | 信息技术学院 | 适用专业与年级 | 数字媒体技术大三 |
| 课程类别与性质 | 专业选修课 | 考核方式 | 考查 |
| 选用教材 | 【计算机文化，（美）琼·詹姆里奇·帕森斯，机械工业出版社，英文版第20版】 | 是否为马工程教材 | 否 |
| 先修课程 | / |
| 课程简介 |

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| This module is designed to develop key understanding and updates on emerging technologies and their effects on computing |
| **Learning Outcome** The learner will | **Assessment Criteria**:The learner can: |
| 1. Be able to discuss latest developments in technology | 1.1. Display knowledge of apps and their evolution1.2. Discuss how these technologies are affecting daily life and consumer behaviours 1.3. Identify how changing technology is changing daily life  |
| 2. Be able to demonstrate an understanding of changing digital devices | 2.1. Identify the changes in digital devices and the ways their functionality is developing 2.2. Discuss the role social media plays in digital technology2.3. Evaluate advantages and disadvantages of the changes in digital devices in everyday life  |
| 3. Be able to analyse how changing technology is changing business | 3.1. Identify and discuss different strategies for corporate digital presence 3.2. Assess the different ways people interact with businesses digitally 3.3. Evaluate the ways businesses better with technology are changing business practice |
| 4. Be able to assess the possibilities of future technology developments | 4.1. Evaluate the developments in augmented reality, connectivity and virtual reality4.2. Discuss the potential of these for business 4.3. Identify the potential future impact digital devices on business |

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| 选课建议与学习要求 | 本课程为计算机领域的专业通识课程，任何专业、年级的学生均可根据自身兴趣和需求选修。 |
| 大纲编写人 |  | 制/修订时间 | 2022年9月 |
| 专业负责人 |  | 审定时间 | 2022年9月 |
| 学院负责人 | 刘潇莹 | 批准时间 | 2022年9月 |

二、课程目标与毕业要求

（一）课程目标

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| 类型 | 序号 | 内容 |
| 知识目标 | 1 | 了解当代数字媒体技术涉及到的各计算机领域基础知识，以及相关领域技术的发展道路。 |
| 2 | 能有意识地对比同领域技术在不同国家和地区中不同的应用现状，理性客观地分析产生该不同现状的原因。 |
| 技能目标 | 3 | 学习各计算机领域的基础技术，并能将其初步应用于自身需求。 |
| 4 | 培养学生结合理论与实践的能力，使学生能够多角度分析和评价实践结果，提高学生分析、解决问题能力。 |
| 素养目标(含课程思政目标) | 5 | 培养学生爱国主义情操，能够从优秀传统文化和革命历史中汲取养分，构建爱党爱国的理想信念。 |
| 6 | 通过课程思政、校企育人的联动，培养学生具有正确的价值引领、合法守规的职业操守以及抗压能力。 |

（二）课程支撑的毕业要求

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| LO1工程知识：具备扎实的数学、自然科学、数字媒体领域工程其础和专业知识，能够将各类知识用于解决数字媒体领成的复杂工程问题。③制够综合应用数学、物理、统计学、数字媒体领域工程基础知识和专业知识解决数字媒体领域复杂工程问题，能够分析解决方案的可行性与复杂性评价并确定解决方案 |
| LO4研究：能够基于计算机科学原理和方法，对开发的复杂计算机软硬件系统及系统工程问题进行研究，设计合理的实验方案，能对实验数据进行分析与解释、并通过信息综合得到合理有效的结论。③综合运用理论证明、实验仿真或系统实现等多种科学方法对实验结果进行分析与解释，通过信息综合得到合理有效的结论。 |
| LO5使用现代工具：能够针对数字技术领域复杂工程问题，选择与使用恰当的技术，使用媒体创作、虚拟现实、资源管理等软件工具，进行设计与开发，·并能够针对工程应用需求，在通用工具基础上二次开发或定制。①理解计算机专业设计的现代仪器、软硬件平台，开发测试工具、配置管理工具、信息检索工具的原理和使用方法及其局限性。 |
| LO12终身学习：具有自主学习和终身学习的意识，有不断学习和适应发展的能力。能认识不断探索和学习的必要性，具有自主学习和终身学习的意识。 |

（三）毕业要求与课程目标的关系

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| --- | --- | --- | --- | --- |
| 毕业要求 | 指标点 | 支撑度 | 课程目标 | 对指标点的贡献度 |
| L01 | ③ | M | 1.了解当代数字媒体技术涉及到的各计算机领域基础知识，以及相关领域技术的发展道路。 | 100 |
| 2.能有意识地对比同领域技术在不同国家和地区中不同的应用现状，理性客观地分析产生该不同现状的原因。 | 50 |
| L04 | ③ | H | 3.学习各计算机领域的基础技术，并能将其初步应用于自身需求。 | 100 |
| 4.培养学生结合理论与实践的能力，使学生能够多角度分析和评价实践结果，提高学生分析、解决问题能力。 | 50 |
| L05 | ① | L | 5.培养学生爱国主义情操，能够从优秀传统文化和革命历史中汲取养分，构建爱党爱国的理想信念。 | 50 |
| L12 | ① | L | 6.通过课程思政、校企育人的联动，培养学生具有正确的价值引领、合法守规的职业操守以及抗压能力。 | 50 |

三、课程内容与教学设计

（一）各教学单元预期学习成果与教学内容

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| **第一章 数字内容 A部分 和 第二章 数字设备 A部分 Module 1 Digital Content Section A & Module 2 Digital Devices Section A** **理论课时 2 Theoretical class hour 2**知识要求 Knowledge requirements1. 理解二进制系统，数据存储单位，有损压缩和无损压缩，典型设备组件和形状因子。

Understand binary systems, data storage units, lossy and lossless compression, typical equipment components and shape factors.1. 运用ASCII码进行文本解密，在主板上识别微处理器及其性能，说明如何维护触摸屏和提高电池寿命。

Using ASCII code for text decryption, identify the microprocessor and its performance on the motherboard, and explain how to maintain the touch screen and high battery life.能力要求 Capability requirements1. 识别微处理器，具有翻盖或直板形状因子的典型设备组件。

Identify microprocessors, typical equipment components with flip or straight plate shape factors.1. 区分有损压缩和无损压缩，OCR和Image Scanner.

Distinguish lossy compression from lossless compression, OCR and image scanner.教学难点 Teaching difficulties1. 计算机数位系统与数据存储单位。

Computer digital system and data storage unit.1. 计算机编码方式和编解码。

Computer coding method and encoding and decoding.1. 计算机设备组件和性能。

Computer equipment components and performance. |
| **第二章 数字设备 B、C部分 Module 2 Digital Devices Section B-C** **理论课时 2 Theoretical class hour 2**知识要求 Knowledge requirements1. 了解企业级计算机的三种类型和个人计算机分类，支持手机语言和短信的设备，微处理器指令集的重要性。

Understand the three types of enterprise computers and the classification of personal computers, the devices supporting cellular voice and SMS, and the importance of microprocessor instruction set.1. 分析处理指令时，如何通过RAM、控制单元和ALU追踪指令。

Analyze how to track instructions through ram, control unit and ALU as processing instructions.能力要求 Capability requirements1. 能够根据性能需要，选择正确配置的数字设备。

Be able to select the correctly configured digital equipment according to the performance needs.教学难点 Teaching difficulties1. 微处理器指令集的重要性和x86和ARM标准的差异。

The importance of microprocessor instruction set and the differences between x86 and arm standards.1. 微处理器处理指令过程。

The process of processing instructions by a microprocessor.1. 计算机启动过程中的步骤及影响微处理器性能的因素。

Steps in computer startup and factors affecting microprocessor performance. |
| **第二章 数字设备 D-E部分 Module 2 Digital Devices Section D-E** **理论课时 2 Theoretical class hour 2**知识要求 Knowledge requirements1. 知道存储选项的标准、三种类型的光存储介质、四个常见的备份对、Windows用户可用的备份工具、三个不可使用蓝牙连接的设备、影响显示质量的四个因素、五种为自动驾驶车辆提供输入的五种传感器。

Know the standard of storage options, three types of optical storage media, four common backup pairs, backup tools available to Windows users, three devices that cannot use Bluetooth connection, four factors affecting display quality, and five sensors that provide input for autonomous vehicles.1. 理解存储器和内存之间的关系、数字设备的存储规范、磁存储技术的优缺点、硬盘驱动器故障后恢复的过程、GPU的作用、分辨率设置如何影响屏幕上的对象和文本的大小。

Understand the relationship between storage and memory, the storage specifications of digital devices, the advantages and disadvantages of magnetic storage technology, the recovery process after hard disk drive failure, the role of GPU, and how the resolution setting affects the size of objects and text on the screen.能力要求 Capability requirements1. 识别常见的扩展端口和连接器，如USB、VGA、HDMI、DVI、DisplayPort、雷电接口和以太网。

Identify common expansion ports and connectors, such as USB, VGA, HDMI, DVI, DisplayPort, Thunderbolt and Ethernet.1. 评估各种项目的存储策略。

Evaluate storage strategies for various projects.教学难点 Teaching difficulties1. 存储器和内存之间的关系。

The relationship between storage and memory.1. 数字设备的存储规范。

Storage specification for digital devices.1. 各种存储方式的有缺点。

Various storage methods have disadvantages.1. 计算机内外信息传输路径。

Information transmission path inside and outside the computer.1. 分辨率设置与屏幕上对象和文本大小的关系。

The relationship between the resolution setting and the size of objects and text on the screen. |
| **第四章 万维网 A-B部分 Module 4 The Web Section A-B** **理论课时 2 Theoretical class hour 2**知识要求 Knowledge requirements1. 知道万维网的四项基本技术、四种流行的浏览器。

 Know the four basic technologies and four popular browsers of the world wide web.1. 理解浏览器层次结构、URL的规则、默认浏览器和浏览器主页之间的差异、预测服务的目的、浏览器扩展和插件的区别。

Understand browser hierarchy, rules of URL, differences between default browser and browser home page, purpose of prediction service, differences between browser extensions and plug-ins.能力要求 Capability requirements1. 识别浏览器窗口的以下元素：地址框、刷新和主页按钮、后退和前进按钮、选项卡和设置菜单。

Identify the following elements of a browser window: address box, refresh and home buttons, back and forward buttons, tabs, and settings menu.1. 评估双向超文本链接在改善用户在线搜索体验上的作用。

Evaluate the role of two-way hypertext links in improving users' online search experience.1. 评测允许浏览器存储密码所带来的潜在问题和风险。

Profile the potential problems and risks posed by allowing browsers to store passwords.教学难点 Teaching difficulties1. 单向与双向超文本链接。

Unidirectional and bidirectional hypertext links.1. URL的结构和使用规则。

Structure of URL and rules of utility.1. 浏览器缓存和允许浏览器存储密码对隐私带来的潜在问题。

Browser cache and the potential problem with allowing browser to store passwords. |
| **第四章 万维网 C-D部分 Module 4 The Web Section C-D** **理论课时 2 Theoretical class hour 2**知识要求 Knowledge requirements1. 知道HTML和类似的标记语言、用于创建网页的四种工具。

 Know HTML and similar markup languages and four tools for creating web pages.1. 理解HTML文档和网页之间的关系、CSS的用途、内联CSS与内部和外部CSS、静态网页和动态网页之间的区别、Web托管服务的用途、公开密钥加密系统。

Understand the relationship between HTML documents and web pages, the purpose of CSS, the difference between inline CSS and internal and external CSS, static web pages and dynamic web pages, the purpose of web hosting services, and public key encryption system.能力要求 Capability requirements1. 识别HTML标记并说明其特征、完成请求和请求不存在的HTTP状态代码、浏览器何时显示安全站点，在该站点上可以安全地输入密码、财务信息和其他个人数据。

Identify HTML tags and explain their characteristics, complete the request and HTTP status code where the request does not exist, when the browser displays a secure site where passwords, financial information and other personal data can be safely entered.1. 正确使用浏览器请求方法。

Use the browser request method correctly.1. 评测会话cookies和持久cookies对于用户个人隐私所带来的风险。

Evaluate the risks of session cookies and persistent cookies to users' personal privacy.教学难点 Teaching difficulties1. HTML标记语言系统和CSS。

HTML markup language system and CSS.1. 网站创建和托管。

Site creation and hosting.1. Cookie和HTTP无状态协议之间的关系。

The relationship between cookies and HTTP’s stateless protocol.  |
| **第四章 万维网 E部分 Module 4 The Web Section E** **理论课时 2 Theoretical class hour 2**知识要求 Knowledge requirements1. 知道流行的搜索引擎网站、搜索引擎的四个组件。

Know the popular search engine website and the four components of search engine.1. 理解网络爬虫的工作原理、缓存页面和实时页面的差别、搜索引擎索引器的工作原理、搜索历史对隐私的重要性、搜索历史记录和浏览器历史记录的区别。

Understand the working principle of web crawler, the difference between cached pages and real-time pages, the working principle of search engine indexer, the importance of search history to privacy, and the difference between search history and browser history.能力要求 Capability requirements1. 运用搜索运算符提高查询效率。

Use search operators to improve query efficiency.1. 使用公允使用的一般准则评估搜索资料的在研究工作中的适用性。

Use the general criteria of fair use to evaluate the applicability of the search data in the research work.教学难点 Teaching difficulties1. 搜索引擎的工作原理。

How search engines work.1. 公允使用的一般准则。

General guideline of fair use. |
| **第五章 社交媒体 A-B部分 Module 5 Social Media Section A-B** **理论课时 2 Theoretical class hour 2**知识要求 Knowledge requirements1. 知道社交网络、地理社交网络、内容社区和在线通信，社交媒体档案的三要素、可用于定位移动和固定设备的四种技术、四种类型的知识产权、共享许可证的六项权利、合理使用的四个因素。

Know the three elements of social network, geographic social network, content community and online communication, social media archives, four technologies that can be used to locate mobile and fixed devices, four types of intellectual property rights, six rights of shared license, and four factors of rational use.1. 理解众包、从邻接矩阵得出的推论、病毒媒体、内容存储的位置以及对隐私的影响、大多数内容社区的财务模式。

Understand crowdsourcing, inference from adjacency matrix, viral media, location of content storage and impact on privacy, and financial model of most content communities.能力要求 Capability requirements1. 使用社交媒体蜂巢分析各种社交媒体。

Use the social media hive to analyze various social media.1. 运用六度分离分析社交网络。

Use six degree separation to analyze social networks.教学难点 Teaching difficulties1. 使用社交媒体蜂巢和六度分离分析社交媒体。

Social media was analyzed using social media hive and six degree separation.1. 知识产权、知识共享许可证、版权。

Intellectual property, knowledge sharing license, copyright. |
| **第五章 社交媒体 C-D部分 Module 5 Social Media Section C-D** **理论课时 2 Theoretical class hour 2**知识要求 Knowledge requirements1. 知道博客页面的结构、五个有助于评估博客信息质量的问题、Twitter页面的主要元素、有助于降低在公用计算机上访问电子邮件的安全风险的四个步骤、VoIP技术的四种服务。

Know the structure of blog page, five problems that help to evaluate the quality of blog information, the main elements of Twitter page, four steps that help to reduce the security risk of accessing e-mail on public computers, and four services of VoIP technology.1. 理解RSS阅读器和博客聚合器、Wiki的特征、维基百科文章的编写和编辑、维基百科中NPOV、NOR和V的含义、“存储和转发”与电子邮件的关系。

Understand RSS readers and blog aggregators, Wiki features, Wikipedia article writing and editing, the meaning of NPOV, nor and V in Wikipedia, and the relationship between "store and forward" and e-mail.能力要求 Capability requirements1. 运用通信技术的分类法。

Using the classification of communication technology.教学难点 Teaching difficulties1. 博客、Twitter和维基百科。

Blog, Twitter, and Wikipedia.1. IMAP/POP和VoIP。

IMAP/POP and VoIP. |
| **第五章 社交媒体 E部分 Module 5 Social Media Section E** **理论课时 2 Theoretical class hour 2**知识要求 Knowledge requirements1. 知道构成联机标识的元素、木偶用于欺骗的四种方式、使用在线笔名的三种情况、五种可能破坏网络声誉的因素、五种声誉管理做法、社交媒体数据类型。

Know the elements that make up the online identity, the four ways puppets are used to cheat, the three cases of using online pseudonyms, five factors that may damage the network reputation, five reputation management practices, and social media data types.1. 理解为什么应该避免使用通用配置文件映像、在线身份和在线声誉、模仿者和翻拍者、在线状态如何对个人隐私构成威胁。

Understand why you should avoid using common profile images, online identity and online reputation, impersonator and doppelganger, and how online status poses a threat to personal privacy.能力要求 Capability requirements1. 分析使用第三方社交媒体用于程序的潜在问题。

Analyze potential problems using third-party social media for applications.教学难点 Teaching difficulties1. 在线身份和在线声誉。

Online identify and online reputation.  |
| **第六章 软件 A-B部分 Module 5 Software Section A-B** **理论课时 2 Theoretical class hour 2**知识要求 Knowledge requirements1. 知道软件类别、流行的开源软件许可证、四类操作系统、操作系统管理的数字设备资源。

Know software categories, popular open-source software licenses, four types of operating systems, and digital device resources managed by the operating system.1. 理解软件更新与升级、软件许可证、操作系统内核的用途、多任务、多处理和多线程，由操作系统管理的缓冲区、操作系统的优缺点。

Understand software update and upgrade, software license, purpose of operating system kernel, multitasking, multiprocessing and multithreading, buffer managed by operating system, advantages and disadvantages of operating system.能力要求 Capability requirements1. 使用常用软件定价模型测评软件并预测软件定价模式的发展趋势。

Use common software pricing models to evaluate software and predict the development trend of software pricing model.1. 使用虚拟机测评各种操作系统的优缺点。

Use virtual machines to evaluate the advantages and disadvantages of various operating systems.教学难点 Teaching difficulties1. 操作系统的内核和管理系统。

Operating System kernel and administration system.1. 虚拟机与操作系统。

Virtual machine and operating systems.  |
| **第六章 软件 C-D部分 Module 5 Software Section C-D****理论课时 2 Theoretical class hour 2**知识要求 Knowledge requirements1. 知道网络应用程序的优缺点、office条件核心、数据库表中字段和记录的差异。

Know the advantages and disadvantages of network applications, the core conditions of office, and the differences between fields and records in database tables.1. 理解网络应用程序和移动应用程序的差异、越狱、PC软件安装过程、Mac软件安装过程与卸载。

Understand the differences between network applications and mobile applications, prison break, PC software installation process, mac software installation process and uninstall.能力要求 Capability requirements1. 使用假设分析提高工作效率。

Use what-if analysis to improve work efficiency.1. 使用数字运算符和单元引用的电子表各公式提高工作效率。

Use numeric operators and spreadsheet formulas referenced by cells to improve work efficiency.教学难点 Teaching difficulties1. 网络应用程序和移动应用程序的差异和优缺点。

Differences, advantages and disadvantages between web applications and mobile applications.1. 在PC上和Mac上安装与卸载软件的差异。

Differences between installing and uninstalling software on PCs and Macs.1. 通过办公套件提高文字处理、表格数据管理、及信息传递效率。

Improve the efficiency of word processing, form data management and information transmission through office suite. |
| **第六章 软件 E部分 Module 5 Software Section E** **理论课时 2 Theoretical class hour 2**知识要求 Knowledge requirements1. 知道五种文件命名约定、 数字设备上完整的文件路径、Windows文件资源管理器和MacOS Finder的基本元素。

Know five file naming conventions, complete file paths on digital devices, basic elements of windows file explorer and MacOS finder.1. 理解在PC上的存储设备如何用设备字幕命名或制定、物理存储模型和逻辑存储模型之间的差异、操作系统使用索引文件的原因。

Understand how the storage device on the PC is named or formulated with device subtitles, the difference between physical storage model and logical storage model, and the reason why the operating system uses index files.能力要求 Capability requirements1. 评测硬盘分区的合格性和文件管理的效率。

Evaluate the qualification of hard disk partition and the efficiency of file management.教学难点 Teaching difficulties1. 物理存储模型和逻辑存储模型之间的差异。

The difference between physical storage model and logical storage model.1. 操作系统管理文件的过程和基于应用程序的文件管理。

The process of operating system file management and application-based file management. |
| **第七章 数字安全 C & E部分 Module 5 Digital Security Section C & E****理论课时 2 Theoretical class hour 2**知识要求 Knowledge requirements1. 知道网络入侵的不同种类 - RATs、远程连接、勒索软件、机器人网络等,。

Know RATs, remote utilities, ransomware, and botnets are the most common types of online intrusions.1. 理解防火墙、防入侵软件以及杀毒软件的不同及使用环境，了解黑名单和白名单，理解为什么路由器可以看作一种个人防火墙。

Understand the differences and operation environments of firewall, anti-exploit software and anti-virus software. Know blacklist and whitelist; understand why router can be seen as a personal firewall.能力要求 Capability requirements1. 使用netstat命令查询PC上开发的端口，及使用该端口的进程。

Use netstat in command line and list open ports on a PC, also list the process ids that use each port.1. 使用垃圾邮件过滤器过滤指定种类的垃圾邮件。

Use spam filter provided by email service provider to filter out specific types of spam.教学难点 Teaching difficulties1. 掌握netstat命令的各种带参数使用方式。

Handle different parameters when using netstat command, and their functionalities.1. 不同种类(普通、DNS、HOST)的Pharming的辨析。

Tell the difference between normal Pharming, DNS Pharming and HOST Pharming.  |
| **第八章 信息系统 A-B部分 Module 5 Information System Section A-B** **理论课时 2 Theoretical class hour 2**知识要求 Knowledge requirements1. 知道垂直和水平市场，问题的分类，交易处理系统、管理信息系统、决策支持系统和专家系统，电子商务类型。

Know the vertical and horizontal markets, the classification of problems, transaction processing systems, management information systems, decision support systems and expert systems, and the types of e-commerce.1. 理解一个组织、它的使命和它的信息系统之间的关系，专家系统如何使用模糊逻辑，准时制库存与供应链管理的关系，忠诚度计划与CRM的关系，ERP系统的优点。

Understand the relationship between an organization, its mission and its information system, how expert system uses fuzzy logic, the relationship between just in time inventory and supply chain management, the relationship between loyalty program and CRM, and the advantages of ERP system.能力要求 Capability requirements1. 根据组织架构图将员工与战略、战术、运营规划需求进行匹配。

Match employees with strategic, tactical and operational planning according to the organization chart.教学难点 Teaching difficulties1. 组织结构与战略、战术、运营规划。

Organization structure and strategic, tactical, operational planning.1. 不同的信息系统类型和优缺点。

Pros and cons of each information system.  |
| **第八章 信息系统 C-D部分 Module 5 Information System Section C-D****理论课时 2 Theoretical class hour 2**知识要求 Knowledge requirements知道SDLC的五个阶段，可用于系统分析的工具，设计团队可以用的四类解决方案。Know the five stages of SDLC, the tools that can be used for system analysis, and the four types of solutions that can be used by the design team.理解计划阶段进行的任务，分析阶段进行的活动，系统开发设计阶段进行的活动，特征蠕变，实际阶段进行的活动和测试类型。Understand the tasks carried out in the planning stage, the activities carried out in the analysis stage, the activities carried out in the system development and design stage, the characteristics of creep, the activities carried out in the actual stage and the types of tests.能力要求 Capability requirements使用波特五力模型和PIECES对问题和机会进行分类。Problems and opportunities are classified using Porter's five forces model and PIECIES.使用QoS指标对系统开发设计及后续维护进行测评。The QoS index is used to evaluate the system development, design and subsequent maintenance.教学难点 Teaching difficulties系统开发流程。System development process. |
| **第九章 数据库 A-B部分 Module 5 Database Section A-B** **理论课时 2 Theoretical class hour 2**知识要求 Knowledge requirements知道与操作数据库相关的活动，DBMS，对数据库管理非常重要的安全措施。Knowing the activities related to operating the database, DBMS, is a very important security measure for database management.理解操作数据库和分析数据库的区别，ERD和一对一、一对多和多对多关系，可序列化性的概念与数据库的关系。Understand the differences between operational database and analytical database, ERD and one-to-one, one to many and many to many relationships, and the relationship between the concept of serializability and database.能力要求 Capability requirements使用ERD进行数据库设计。Use ERD for database design.教学难点 Teaching difficultiesERD和一对一，一对多和多对多关系。ERD and one-to-one, one to many and many to many relationships. |
| **第九章 数据库 C-D部分 Module 5 Database Section C-D****理论课时 2 Theoretical class hour 2**知识要求 Knowledge requirements知道常见的数据输入错误以及数据库设计人员用来减少错误数量的策略，数据库中常见数据类型。Know the common data input errors and the strategies used by database designers to reduce the number of errors, and the common data types in the database.理解规范化数据库的原因和方法，排序和索引的区别，设计数据库接口的最佳原则，报告模板的用途，SQL注入如何工作。Understand the reasons and methods of standardizing the database, the differences between sorting and indexing, the best principles for designing the database interface, the purpose of the report template, and how SQL injection works.计算字段节省存储空间。Calculating fields saves storage space.能力要求 Capability requirements使用SQL建立数据库，更新数据库。Use SQL to establish the database and update the database.教学难点 Teaching difficulties数据库规范化和接口设计最佳原则。The best principles of database standardization and interface design.SQL语言规范。SQL language specification. |
| **第九章 数据库 E部分 Module 5 Database Section E** **理论课时 2 Theoretical class hour 2**知识要求 Knowledge requirements知道第三代计算平台的元素，5Vs，NoSQL。Know the elements of the third generation computing platform, 5vs and NoSQL.理解大数据的数据集，放大与缩小之间的区别，动态扩展的工作原理，Hadoop和MapReduce。Understand the data set of big data, the difference between scaling in and scaling out, the working principle of dynamic expansion, Hadoop and MapReduce.描述并绘制关键值数据模型的示例。Describe and draw examples of key value data models.能力要求 Capability requirements评测存储在关系数据库中的数据和存储在面向列的数据库中的数据的不同检索策略。Evaluate different retrieval strategies for data stored in relational database and data stored in column- oriented database.教学难点 Teaching difficulties非关系数据库。Non-relational database.动态扩展。Dynamic scaling. 存储在关系数据库中的数据和存储在面向列的数据库中的数据的不同检索策略。Different retrieval strategies for data stored in relational database and data stored in column- oriented database. |
| **第十章 编程 A-B部分 Module 5 Programming Section A-B** **理论课时 2 Theoretical class hour 2**知识要求 Knowledge requirements知道编程方法类型，程序测试期间可能遇到的三种类型的错误，低级语言和高级语言，三种传统编程语言。Know the type of programming method, three types of errors that may be encountered during program testing, low-level language and high-level language, and three traditional programming languages.理解编程和软件工程的区别，问题陈述的三个核心要素，常量与变量，形式化方法的意义，STRIDE和DREAD的目的，防御性编程的重要性，抽象概念如何应用于编程语言。Understand the difference between programming and software engineering, the three core elements of problem statement, constants and variables, the significance of formal methods, the purpose of STRIDE and DREAD, the importance of defensive programming, and how abstract concepts are applied to programming languages.能力要求 Capability requirements运用抽象概念和形式化方法进行程序设计。Abstract concepts and formal methods are used for programming.教学难点 Teaching difficulties预测方法论和敏捷方法论。Predictive methodology and agile methodology. |
| **第十章 编程 C-D部分 Module 5 Programming Section C-D****理论课时 2 Theoretical class hour 2**知识要求 Knowledge requirements知道用于表达算法的三种工具。Know three tools for expressing algorithms.理解算法与编程的关系，选择控制结构、重复控制结构如何控制程序流，程序范式的优缺点，在面向对象范式中对象和类的重要性，继承，面向对象程序中方法和消息之间的关系，多态性，封装与抽象的关系。Understand the relationship between algorithm and programming, select control structure and repetitive control structure, how to control program flow, the advantages and disadvantages of program paradigm, the importance of objects and classes in object-oriented paradigm, inheritance, the relationship between methods and messages in object-oriented program, polymorphism, and the relationship between encapsulation and abstraction.能力要求 Capability requirements使用过程编程范式和面向对象范式编写程序。Write programs using process programming paradigm and object-oriented paradigm.教学难点 Teaching difficulties函数、选择控制结构及重复控制结构对程序流的影响。The influence of function, selection control structure and repetitive control structure on program flow.继承和封装。Inheritance and encapsulation.  |
| **第十章 编程 E部分 Module 5 Programming Section E** **理论课时 2 Theoretical class hour 2**知识要求 Knowledge requirements理解说明性范式与过程性范式和面向对象范式的区别，Prolog事实和Prolog规则的区别，Prolog如何使用目标。Understand the difference between declarative paradigm and procedural paradigm and object-oriented paradigm, the difference between Prolog facts and Prolog rules, and how Prolog uses goals.能力要求 Capability requirements使用Prolog编程。Write programs using declarative paradigm. 教学难点 Teaching difficulties说明性范式逻辑。Declarative paradigm logic.  |

（二）教学单元对课程目标的支撑关系

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 课程目标教学单元 | 1 | 2 | 3 | 4 | 5 | 6 |
| 第一章 | √ |  | √ |  |  |  |
| 第二章 | √ |  |  |  |  |  |
| 第四章 | √ |  | √ |  |  |  |
| 第五章 | √ | √ |  |  | √ | √ |
| 第六章 | √ |  |  |  |  |  |
| 第八章 | √ | √ |  |  | √ | √ |
| 第九章 | √ |  |  | √ |  |  |
| 第十章 | √ |  | √ | √ |  |  |

（三）课程教学方法与学时分配

|  |  |  |  |
| --- | --- | --- | --- |
| 教学单元 | 教与学方式 | 考核方式 | 学时分配 |
| 理论 | 实践 | 小计 |
| 第一章 | 讲授、讨论、问题解决法 | 课题练习 | 2 | 8 | 10 |
| 第二章 | 讲授、讨论 | 课题练习 | 2 | 0 | 2 |
| 第四章 | 讲授、讨论、问题解决法 | 个人作业 | 2 | 8 | 10 |
| 第五章 | 讲授、讨论 | 课题练习 | 2 | 0 | 2 |
| 第六章 | 讲授、讨论 | 课题练习 | 2 | 0 | 2 |
| 第八章 | 讲授、讨论 | 课题练习 | 2 | 0 | 2 |
| 第九章 | 讲授、讨论 | 课题练习 | 2 | 0 | 2 |
| 第十章 | 讲授、讨论、问题解决法 | 小组作业 | 2 | 16 | 18 |
| 合计 | 16 | 32 | 48 |

（四）课内实验项目与基本要求

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 序号 | 实验项目名称 | 目标要求与主要内容 | 实验时数 | 实验类型 |
| 1 | 网络实验 | 通过测速及IP显示网站理解并熟悉计算机网络的基本参数；验证ipconfig、ping、traceroute等命令的作用，学会阅读具体命令回显代表的含义，学会应用不同命令参数进行命令优化。 | 8 | ② |
| 2 | SVG初步探索 | 了解矢量图格式的概念，理解其与普通位图的区别，通过对比SVG编辑器以及自己对图片的简单操作对矢量图建立初步印象。 | 8 | ③ |
| 3 | 数据库实验 | 对比MySQL以及MongoDB这两种典型的关系型/非关系型数据库，根据需求分别设计表并进行增删查改，理解不同数据库的区别以及优势。 | 16 | ③ |
| 实验类型：①演示型 ②验证型 ③设计型 ④综合型 |

四、课程思政教学设计

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| --- |
| 1．在信息安全的相关章节中提出习总书记的“没有网络安全就没有国家安全，没有信息化就没有现代化”总结，提高学生的安全理念和爱国意识。2．在对比同领域技术于不同国家和地区中的应用现状时，提高学生缘事析理、明辨是非的能力，做到因事而化、因时而进、因势而新，使学生能够拥有求真务实、踏实严谨的品质。 |

五、课程考核

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 总评构成 | 占比 | 考核方式 | 课程目标 | 合计 |
| 1 | 2 | 3 | 4 | 5 | 6 |
| X1 | 40 | 期末考核：个人项目报告（2000 words） | 40 | 40 |  | 20 |  |  | 100 |
| X2 | 30 | 过程考核：小组团队作业（1200 words） |  | 60 |  | 20 | 10 | 10 | 100 |
| X3 | 20 | 过程考核：个人作业（800 words） | 60 |  | 20 |  | 10 | 10 | 100 |
| X4 | 10 | 过程考核：课堂表现 | 30 | 20 | 30 |  | 10 | 10 | 100 |

六、其他需要说明的问题

|  |
| --- |
| 无 |