 University of Pathology Informatics (UPI) Program Overview and Course Listing

Summary of Program Requirements

- There are 27 courses available in the UPI curriculum
- The first 12 courses (WMPI1601-1612) are required courses
- 20 courses required to earn certificate
- Participants can select eight elective courses out of 15 based on their interests and skill level to complete the certificate
- Participants must complete the certificate three years from the original purchase date

Instructional Design & Continuing Education Credit

- Courses are delivered online and are approximately 90 minutes in length
- Participants receive access to the ebook *Pathology Informatics: Theory & Practice*
- Many courses include pre-reading assignments, case studies, and knowledge checks
- Each courses includes a post-test and evaluation
- Each course offers 1.5 CME/CMLE or SAM Credit for a total of 25 credits at completion of the certificate

Course Listing and Descriptions

Course Code	WMPI1601-Core Course
Course Title	**Welcome to UPI Certificate**
Competency	Workflow & Processes
Description	This course provides an introduction to the University of Pathology Informatics Certificate, including details about its instructional approach, curriculum, and requirements for completion. The curriculum has been developed for pathologists, pathology trainees, medical technologists, cytotechnologists, histotechnologists, laboratory administrators, and anyone involved in patient care who works in laboratories. It is based on four core domains: Fundamentals of Information, Fundamentals of Information Systems, Workflow Analysis and Process Redesign, and Management and Governance Aspects of Information Science.
Course Code	**WMPI1602-Core Course**
Course Title	**Introduction to Information Systems**
Competency	Information Systems
Description	This course provides an overview of laboratory information systems (LISs), digital pathology systems, and telepathology systems, explaining how these systems are used throughout the preanalytic, analytic, and postanalytic phases of pathology, as well as in laboratory administration.
Course Code	**WMPI1603-Core Course**
Course Title	**Introduction to Pathology Informatics**
Competency	Workflow & Processes

Description	In this course, participants will compare and contrast the characteristics, necessary resources, and appropriate applications of four informatics specialties that are related to pathology: pathology informatics, bioinformatics, health informatics, and public health informatics. The course will also cover how pathology informatics overlaps with these specialties.
Course Code	**WMPI1604-Core Course**
Course Title	**Laboratory Hardware & Software**
Competency	Information Fundamentals
Description	This course explains the fundamentals of laboratory hardware and software. Topics include basic computer components, software types, networks, and databases. The course provides an introduction to laboratory information system (LIS) structure, software, and operations, as well as functionality and relevance of LISs within the laboratory environment.
Course Code	**WMPI1605-Core Course**
Course Title	**Laboratory Networks and Architecture**
Competency	Information Fundamentals
Description	In this course, participants will learn about computer networks, including the different types of networks and the many ways to classify networks. Participants will also learn the difference between private and public networks, and the different hardware and software components that make up networks. Additional topics include standards, a discussion of bandwidth, network security, interfaces, and interoperability.
Course Code	**WMPI1606-Core Course**
Course Title	**Fundamentals of Databases**
Competency	Information Fundamentals
Description	This course provides an essential grounding in databases, including the definition of a database, major characteristics of relational databases, description of typical database designs, and schemas for laboratory information systems. Participants will learn how Structured Query Language (SQL) is used in the lab, its impact on productivity, and how NoSQL databases have transformed the operation of the laboratory.
Course Code	**WMPI1607-Core Course**
Course Title	**Interoperability of Data and Standardization of Terminology**
Competency	Information Fundamentals
Description	In this course, participants will learn about the different types of healthcare information systems, pathology information systems, laboratory information systems and how all of this information is exchanged in a laboratory setting.
Course Code	**WMPI1608-Core Course**
Course Title	**Health Information Standards in Pathology**
Competency	Information Systems
Description	This course focuses the role of healthcare information standards in reducing the level and frequency of errors in the laboratory testing process. Participants will learn about organizations that develop standards and guidelines for healthcare IT

	systems and about standard and frequently encountered software. The course also explains how these IT systems use data extracted to improve processes and systems across the lab.
Course Code	**WMPI1609-Core Course**
Course Title	**Lab Middleware Interfaces**
Competency	Information Fundamentals
Description	This course primarily discusses the basics of interfaces as they relate to the laboratory system. Discussions on how messages are formatted and data is represented in the medical interfaces is distinguished. Point of care testing, laboratory provider linkage function, and utilizing middleware in regards to the lab information system and the laboratory instruments.
Course Code	**WMPI1610-Core Course**
Course Title	**Patient & Asset Identification Tracking Systems for Patient Safety**
Competency	Workflow & Processes
Description	This course focuses on identification and tracking system technologies, including barcoding and biometrics such as iris scan and palm vein technology that can be used in the laboratory, throughout the healthcare system, and between healthcare systems to increase patient safety.
Course Code	**WMPI1611-Core Course**
Course Title	**Patient & Asset Identification Tracking Systems for Workflow**
Competency	Workflow & Processes
Description	Use of every day technologies is getting increasingly transparent and more intuitive. Users of LIS systems have similar expectations toward software that improves asset identification, tracking, and safety. They expect intuitive interfaces and presume to achieve proficiency with minimal training requirements. Nevertheless, these systems are complex and require a clear understanding of their functionality and their limitations. In this module, participants will focus on the impact Patient & Asset Identification Tracking Systems have on laboratory workflow.
Course Code	**WMPI1612-Core Course**
Course Title	**Preparing the Executive Briefing**
Competency	Governance & Management
Description	This course focuses on the different functions of governance and management, especially in relation to IT projects.
Course Code	**WMPI1613**
Course Title	**Practical Use of Business Analytics: Justifying Lab Services of the C Suite (Enduring Material)**
Competency	Governance & Management (Elective)
Description	This course is designed to explore the value of pathology informatics and analytics in the context of the health system. Participants will learn about future financial models in pathology and the role informaticians play in the new financial model of pathology informatics organizations.
Course Code	**WMPI1614**

Course Title	**Clinical Decision Support**
Competency	Workflow & Process (Elective)
Description	This course is designed to educate participants about the workflow process through clinical decision support. Topics include the need for informatics, the evolution of decision support, human factor engineering, traditional vs computational derivation of knowledge, and facing the challenges.
Course Code	**WMPI1615-Elective**
Course Title	**Data Analytics in Pathology (Enduring Material)**
Competency	Workflow & Process
Description	This course focuses on identifying actionable data. Participants will learn what metrics should be used in analyzing data to ensure the effectiveness of diagnostics. They will also learn and how to appropriately measure variations in the data and will explore the limitations of testing guidelines.
Course Code	**WMPI1616**
Course Title	**Informatics and Connectivity Solutions to Enhance Point of Care Testing (Enduring Material)**
Competency	Information Systems (Elective)
Description	This course investigates the current and future states of point-of-care testing (POCT) and discusses the impact that regulatory, informatics, IS/IT, and connectivity issues have on POCT today. The course discusses the advantages of automated information management solutions with wireless transmission of data from POC devices.
Course Code	**WMPI1617**
Course Title	**How to Evaluate and Implement Business Analytics for Your Laboratory (Enduring Material)**
Competency	Governance & Management (Elective)
Description	This course defines business analytics and discusses its importance in the laboratory. Users will gain an understanding of the many settings where business analytics can be used to help drive their practices and laboratories toward future improvement.
Course Code	**WMPI1618**
Course Title	**Computational Pathology (enduring material)**
Competency	Information Systems (Elective)
Description	This course will discuss how computational pathology is an important partner in pathology informatics and how to use it in today's practice. Pathology is uniquely situated in medicine and provides objective and quantifiable via electronic repositories. This course will focus on changing system architectures and research IT support to "unlock" this value for your pathology department.
Course Code	**WMPI1619**
Course Title	**Information Technologies Supporting Educational Methods and Programs (enduring material)**
Competency	Workflow & Process (Elective)

Description	Many information management tools are available to support health science education. This course will explore the variety of tools available, their usage in practice, and the ways they may support education, both in the classroom and with e-learning by students for independent study. Effective Learning environments can enhance student skill development through active learning, teaching for understanding, feedback, and interactivity.
Course Code	**WMPI1620**
Course Title	**Imaging Systems, Practice & Guidelines (enduring material)**
Competency	Information Systems (Elective)
Description	This course provides an overview of imaging basics and a more detailed discussion about developments in imaging technology that are changing the practice of pathology and laboratory medicine, including image management, whole slide imaging, digital pathology practice, image analysis, and guidelines.
Course Code	**WMPI1621**
Course Title	**How to Validate a Whole Slide Scanner System**
Competency	Information Fundamentals (Elective)
Description	This course will help learners understand and apply the College of American Pathologists recommendations on validation of a whole slide imaging system and its use in clinical practice. Participants will learn how to design a validation study, with emphasis on logistics, number of specimens needed, and calculating concordance rates. This course also discusses when revalidation of studies is necessary.
Course Code	**WMPI1622**
Course Title	**Supporting Digital Pathology Across the Enterprise**
Competency	Information Fundamentals (Elective)
Description	This course will explore the requirements and opportunities for supporting digital pathology workflow and technical processes across the healthcare enterprise, including whole slide imaging, documentation, training, communication, diagnosis, storage, quality assurance, and more. Associated opportunities and challenges are illustrated with real-world examples and experiences from the Henry Ford Health System.
Course Code	**WMPI1623**
Course Title	**In-Sourcing Digital Consults: Is it For Me?**
Competency	Information Systems (Elective)
Description	This course provides an overview of opportunities for digital pathology consultation that have been made possible by an enhanced all-digital anatomic pathology workflow, including technological advances such as whole slide imaging. First adopters describe their experiences in building digital pathology consulting practices at their institutions and discuss the business, cultural, regulatory, and technological challenges faced in deploying these consultation tools for domestic and international clients.
Course Code	**WMPI1624**

Course Title	**Digital Cytopathology: Digital Imaging-Where are We and What's Next?**
Competency	Workflow & Process (Elective)
Description	This three-module course provides the learner with applicable information to negotiate the demand for expertise in the preparation, screening, and diagnosis of cytologic material, which has increased owing to the growing use of minimally invasive techniques to obtain tissue. The course covers developments in informatics tools that have enhanced the practice of cytopathology and provides an overview of the current state of digital cytology. Topics include digital imaging and automation, using cases involving proficiency testing, remote adequacy assessment by telecytology and whole slide imaging, automated image analysis, and trends around automation of molecular testing of cytologic material.
Course Code	**WMPI1625**
Course Title	**Update on Information Technology Trends That Will Greatly Impact the UPI Practice of Pathology**
Competency	Information Systems (Elective)
Description	Intended for all pathologists, medical technologists, trainees, and other allied laboratorians, this course discusses the developments in information technology most likely to profoundly affect the practice of pathology and laboratory medicine in the next five years. The course makes use of classic SWOT (strengths, weaknesses, opportunities, and threats) analysis for each highlighted exemplar, to investigate the practice areas affected and opportunities for technology to mitigate contemporary challenges.
Course Code	**WMPI1626**
Course Title	**Pathology Informatics for The Practicing Pathologist and Laboratorian**
Competency	Information Fundamentals (Elective)
Description	This two-module course is geared to pathologists and laboratory professionals who do not specialize in informatics. It provides these learners with an extensive grounding in the fundamentals of informatics systems increasingly used in healthcare, with particular attention to their use in pathology and laboratory medicine. The course covers databases, file types, dictionaries, networking, functionality, interfaces, and the advantages and disadvantages of the informatics systems available. It provides information on laws and regulations governing to health information technology and on managing practice change owing to emerging technologies. The course further provides the learner with the tools necessary to keep abreast of technical and regulatory developments in pathology informatics going forward.
Course Code	**WMPI1627**
Course Title	**Optimizing Test and Procedure Selection and Interpretation with Integrated Diagnostics and an Integrated Diagnostics Server**
Competency	Information Systems (Elective)
Description	This course discusses the necessity of teamwork between pathologists and radiologists in advancing integrated diagnostics, in which all laboratory and radiologic information is aggregated and analyzed to arrive at a final diagnosis quickly, efficiently, and inexpensively. The course will cover the development of specialized servers and the creation of virtual departments of pathology/radiology diagnostics. Participants will learn how algorithms, heuristics, and business rules

	developed and tested by pathologists and radiologists can help determine the most efficient path to diagnosis. The course will explain the development and updating of a system that can deliver reports directly to clinicians, indicate the appropriate next orders, and consolidate test-ordering cycles, creating a new care model.