Course Overview

Introduction

The field of digital pathology has expanded rapidly since the launch of the NSH/DPA Digital Pathology Certificate Program in 2018. This growth has been driven by advancements in hardware, machine learning, and access to whole slide imaging systems. To ensure that scientific progress and patient outcomes advance together, comprehensive education must keep pace with these developments. Therefore, NSH and DPA have updated the original program to provide thorough training for a wide range of professionals, including histology technicians and technologists, digital scanning technicians, pathologists, and researchers.

Who is this course for?

Histotechnologists, Histology Technicians, Cytotechnologists, Cytology Technicians, Digital Scanning Technicians, Pathologists, Pathology Residents, Pathologists' Assistant, Research Scientists, Educators, Algorithm and Software Engineers, Individuals associated with or responsible for Laboratory Informatics, or anyone who is interested in or performing any aspect of digital pathology, whole slide imaging, image analysis, and health care data management.

Course Outline

The course consists of eight learning modules with the end goal of the student being awarded a Certificate of Completion to recognize this achievement. The course modules are detailed below.

Module 1: History of Digital Pathology and ROI

- Define the major Environments – Clinical (academic, private & reference labs), Research and Education of digital pathology
- Articulate the general advantages and disadvantages including the value proposition of digital pathology (e.g. ROI, benefits vs. costs).
- Differentiate between Telepathology systems: Static Digital Image Capture, Dynamic or Robotic Image Capture.

Module 2: Basics of the Technology

- Define whole slide imaging systems, components, framework, hardware and software
- Review scanners, viewers and computer monitors
- Discuss IT Infrastructure, image life cycle management, databases, interoperability, cloud storage.
- Discuss the process of image capture, viewing, storage (image life cycle management)

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Module 3: Use Cases for Digital Pathology

- Identify and discuss clinical, educational, research and histology uses for digital pathology.
- Understand future/potential clinical uses and how it will affect the pathology lab.
- Explain how use cases could be applied for your current lab practice.

Module 4: Selecting and Implementing a Digital Pathology Solution

- Participants will learn how to establish requirements for selecting a digital pathology solution
- The module will discuss how to assess digital pathology systems – Hardware & Software (network capabilities)
- Review IT connectivity and image storage considerations

Module 5: Workflow Considerations & Best Practice Standards

- Define a workflow that will best fit into your lab environment
- Define 'best practices'
- An introduction to understanding what is required for quality and compliance (verification, validation and regulations)
- Training and competency for digital pathology
- Managing change control for the digital environment
- Sample Preparation – Histology <need ot determine location>
- Change control processes

Module 6: Image Analysis

- Understand the importance of Image Analysis in Digital Pathology
- Learn how to implement image analysis solutions
- Introduce some commercially available platforms for image analysis

Module 7: Regulatory Requirements & Validations

- Understand the various regulatory oversight, including CAP regulatory requirements for Digital Pathology
- Explain the process for verification and Validation for Clinical Specimens
- Explain the process for validation for Research Specimens
- Explain the validation in Education and Training
- Describe the basics of Data Privacy to reduce risk.

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Module 8: Artificial Intelligence and Digital Pathology

- Understand the evolution and presence of AI in pathology.
- Define the various types of machine learning (supervised, unsupervised, reinforcement).
- Describe algorithmic approaches to machine learning, such as random forest and k-nearest.
- Describe uses cases of AI in bridding the computational gap.

Course Components

Video Learning

The course includes approximately 20 hours of lectures, divided into topic-based modules (detailed in the table below). Learners can follow the modules sequentially or jump between them as needed.

Key Term Warm-Ups

Three optional vocabulary quizzes are available throughout the course to help reinforce key terms before starting a section. A course glossary is also provided, which we recommend printing for easy reference while progressing through the content.

Knowledge Checks

At the end of each section, you'll complete a Knowledge Check consisting of various question formats to assess your understanding. While your score won't impact your ability to move forward, some questions may reappear on the final exam. We encourage you to review your answers before proceeding.

Supplements

The course includes a comprehensive library of SOPs, templates, and sample documents for practical use, along with an extensive collection of relevant literature to support further learning.

Continuing Education Credits

The Digital Pathology Certificate Program also qualifies for NSH continuing education credits or contact hours. To receive the credits you must complete the entire course and pass the final course exam.

When completing the course you will receive a continuing education certificate that you can print directly from your learn.nsh.org account.

The course is worth:

Module	# of CE Credits
Module 1: An Introduction & History of Digital Pathology	1.5
Module 2: Basics of the Technology	3.75
Module 3: Use Cases for Digital Pathology	2

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Module 4: Selecting and Implementing a Digital Pathology Solution	2
Module 5: Workflow Considerations & Best Practice Standards	4
Module 6: Image Analysis	2
Module 7: Regulatory Requirements & Validations	4.25
Module 8: Artificial Intelligence and Digital Pathology	1.25
TOTAL AWARDED HOURS	20.75

Cost

Membership Status	Price
NSH Enhanced Member	$529.00
NSH/DPA Core Member	$569.00
Non Member	$689.00

Access to course is one year from purchase date.

Course Faculty

On behalf of NSH we would like to thank and acknowledge the great work they have done.

- Orly Ardon, PhD, MBA, Director Digital Pathology Operations, Memorial Sloan Kettering
- Robb Angus, CIPP/US, Managing Counsel, Allstate
- Sylvia L. Asa, MD, PhD, FRCP(C), FCAP, FRCPath (Hon), University Health Network, University of Toronto, Toronto, Ontario, Canada
- Tim Baradet, PhD, HTLcm/QIHCcm (ASCP) Digital Pathology Team, Translational Bioinformatics, Bristol Myers-Squibb
- Elizabeth A. Chlipala, BS, HTL(ASCP)QIHC, Partner, Premier Laboratory, LLC
- Quincy Gu, PhD, Assistant Professor, University of Pittsburgh
- Douglas J. Hartman MD, Associate Professor of Pathology, University of Pittsburgh Medical Center
- Stephen M. Hewitt, M.D., Ph.D., FCAP, Experimental Pathology Laboratory, Laboratory of Pathology, Center For Cancer Research, National Cancer Institute, National Institutes of Health
- Michael Isaacs, Director of Clinical Informatics & Business Development, Pathology & Immunology, Washington University School of Medicine
- David Kim, MD, Assistant Attending at Memorial Sloan Kettering Cancer Center, Department of Pathology and Laboratory Medicine.
- Olga Kochar, MS, CSSGB, Director of Laboratory and Transfusion Services, The George Washington University Hospital
- Scott Mackie, WSI Technical Specialist, Cleveland Clinic
- Taofic Mounajjed MD, Consultant, Division of Anatomic Pathology, Department of Laboratory Medicine and Pathology Mayo Clinic, Rochester, MN

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- Liron Pantanowitz, MD, Director of Pathology Informatics, University of Pittsburgh Medical Center
- Anil V Parwani, MD., PhD., MBA, Department of Pathology, The Ohio State University
- Ankush Patel, MS, Pathology and Informatics Consultant
- Dr. Ankush Patel, MD, Pathology Consultant
- Mohamed Salama, MD, Senior Associate Consultant, Mayo Clinic, Medical Director of Mayo Medical Labs
- Renee J. Slaw, MBA, FACHE, Assistant Director, Pathology & Laboratory Medicine, Hospital for Special Surgery, NY
- Adam Smith, Sales Applications Scientist. Indica Labs, Inc.
- Bethany Williams MBBS BSc, Digital Pathology Fellow, Leeds Teaching Hospitals NHS Trust, University of Leeds
- Yukako Yagi, PhD, Director, Pathology Digital Imaging, Memorial Sloan Kettering Center
- Rong Xia, MS, PhD, Pathologist, NYU Langone

Course Design

The certificate program was designed by an NSH Workgroup. Over the course of one year these individuals developed a course outline which was then converted into the final seven learning modules, created a course glossary, curated additional resources and identified the expert faculty. The NSH Workgroup included:

- Elizabeth A. Chlipala, BS, HTL(ASCP)QIHC, Partner, Premier Laboratory, LLC
- Traci DeGeer, Global Product & Innovation Manager – Bond RX, Leica Biosystems
- Kathleen Dwyer, HT(ASCP), Director, National Quality Assessment, Quest Diagnostics
- Shelley Ganske, RT(CSMLS), Pathology Quality Specialist, Diagnostic Services of Manitoba
- David Krull, HT(ASCP)QIHC, Sr. Scientific Investigator, GlaxoSmithKline
- Haydee Lara, Investigator, GlaxoSmithKline
- Lisa Manning, Pathology Technical Director, Diagnostic Services of Manitoba
- Liron Pantanowitz, MD, Director of Pathology Informatics, University of Pittsburgh Medical Center
- Dylan Steiner, HTL(ASCP)QIHC, Biomarker Analyst, GlaxoSmithKline
- Lisa Stephens, MBA, HTL(ASCP)^{cm}, Supervisor, ePathology, Cleveland Clinic
- Aubrey Wanner, CEO, National Society for Histotechnology
- Connie Wildeman, Education Director, National Society for Histotechnology

Questions?

Please contact the NSH headquarters office, histo@nsh.org or via phone, 443-535-4060.

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