

The National Society for Histotechnology, in collaboration with the Digital Pathology Association, developed this online, self-paced certificate program to increase knowledge and improve competence in whole slide imaging and digital pathology.

Digital Pathology and Whole Slide Imaging technology is growing in popularity not only because of the flexibility it creates for lab personnel and pathologists and its long-term cost-effective nature, but also because of its ability to fill critical gaps for diagnosis in remote areas and in locations where there is a lack of subspecialists.

It is becoming a more effective means of delivering consistent, high-quality education to students, and is allowing researchers the opportunity to share information in more effective ways, thus advancing medicine.

It's for these reasons and more that Whole Slide Imaging is becoming a focus for governing agencies like FDA, CAP and CLIA and why this technology is no longer just a possibility but is being integrated into facilities and organizations at a rapid pace.

Learning Modules

The course consists of seven 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: An Introduction & History of Digital Pathology

- Participants will be provided an explanation of the goals, processes and overviews of modules.
- Define the major Environments – Clinical (academic, private & reference labs), Research and Education of digital pathology
- Understand the History/Background/Evolution of Digital Pathology - and be able to 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, storage (image life cycle management), databases, interoperability
- Discuss the process of image capture, viewing, storage and management

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
- A brief explanation of image and pathologist validation
- Sample Preparation – Histology
- An introduction to best practices/standards

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

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

- Regulatory overview including CAP regulatory requirements for Digital Pathology
- Verification and Validation for Clinical Specimens
- Validation for Research Specimens
- Validation in Education and Training

Learning Module Format

The course contains several hours of lectures. To ensure this large amount of material is digestible the course modules have been designed in sections. For example Module 2 contains 5 sections allowing you to view the entire module in one sitting or schedule time to view each section separately.

Module 2

- 2.1 Module Overview
- 2.2 Whole Slide Imaging Systems
- 2.3 Scanners
- 2.4 Image Viewers & Computer Monitors
- 2.5 IT Infrastructure



Knowledge Checks

At the conclusion of each section you will be asked to complete a Knowledge Check. Knowledge Checks consist of several questions – asked in a variety of formats - about the section you just completed.

Your knowledge check score does not prevent you from moving onto the next section however these questions may appear again in the final course exam, so we encourage you to take a minute to review your answers before moving on.

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	1.0
Module 2: Basics of the Technology	3.0
Module 3: Use Cases for Digital Pathology	3.25
Module 4: Selecting and Implementing a Digital Pathology Solution	3.0
Module 5: Workflow Considerations & Best Practice Standards	4.25
Module 6: Image Analysis	3.25
Module 7: Regulatory Requirements & Validations	4.25
TOTAL AWARDED HOURS	22.0

Certificate of Completion

To receive your official certificate of completion you will need to submit your learn.nsh.org CE documentation to NSH online at: <http://www.nsh.org/learn/pathology-certificate>

Once we receive your submission NSH will document your completion of the course and mail a certificate recognizing your achievement within 14 business days.

Cost

Membership Status	Price
NSH or DPA Member	\$499.00
Non-Member	\$599.00

Course Faculty

The 7 learning modules of this course are made up of 29 distinct sections. Each section was taught by a subject matter expert who contributed their time and knowledge to this important resource. On behalf of NSH we would like to thank and acknowledge the great work they have done.

- [Sylvia L. Asa](#), MD, PhD, FRCP(C), FCAP, FRCPath (Hon), University Health Network, University of Toronto, Toronto, Ontario, Canada
- [Tim Baradet](#), PhD, HTLcm/QIHcmm (ASCP) Digital Pathology Team, Translational Bioinformatics, Bristol Myers-Squibb
- [Elizabeth A. Chlipala](#), BS, HTL(ASCP)QIHC, Partner, Premier Laboratory, LLC
- [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
- [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
- [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
- [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

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](#), Supervisor, ePathology, Cleveland Clinic
- [Aubrey Wanner](#), Director Meetings & Education, National Society for Histotechnology
- [Connie Wildeman](#), Project Coordinator Meetings & Education, National Society for Histotechnology

Questions?

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