NSE talent sprint

Pioneer the Technology led Healthcare Revolution

Digital Health and Imaging

Advanced Certification Programme in Digital Health and Imaging

Programmme Partner

Indian Institute of Science
भारतीय विज्ञान संस्थान

IISc Campus

For professionals working at the intersection of Healthcare and Technology building eHealth, Telemedicine, Personalized Healthcare, BioTech, Medical Devices, Wearables, Digital Therapeutics and similar solutions.

Be at the epicenter of the future of health

AI will create 7 lakh jobs for healthcare sector by 2030

BIF
BROADBAND INDIA FORUM

The Indian Digital Health market is estimated to reach INR 485 Bn by 2024.

RESEARCHANDMARKETS
THE WORLD'S LARGEST MARKET RESEARCH STORE

By 2020 medical data will double every 73 days.

IBM

Covid-19 Accelerates the Adoption of Telemedicine.

BAIN & COMPANY

6 Reasons Why Professionals Prefer this Programme

IISc Advantage
Get certified by IISc, India's #1 University and access the world-class institutional knowledge in Biomedical Science and Deep Tech Research

Expert Faculty
Learn from top Biomedical faculty with combined expertise in Computational Data Science and Biological Sciences

Unique Design
A unique executive programme designed to help professionals at the intersection of healthcare and technology

1:1 Mentoring
Personal mentoring by experts to help you in your learning journey

Peer Networking
Join the elite community of top digital health professionals, practitioners and researchers

TalentSprint Advantage
Build your expertise 24x7 with our best-in-class pracademic platform

About the Programme

The healthcare ecosystem is rapidly shifting towards innovative care delivery models such as virtual, remote, and alternate care. The deployment of AI, advanced data analytics, Internet of Things (IoT) as well as other emerging technologies and data-driven tools, are changing the nature of healthcare solutions and delivery systems.

Companies are innovating faster to adapt to new needs: patients are being treated remotely through mobile doctor apps, symptom-checking bots are triaging patients and providing tailored advice, and new remote consultation and tracking solutions are hitting the market fast.

Indian Institute of Science (IISc), Centre for Continuing Education (CCE), with its expertise in multi-disciplinary science is best positioned to offer a programme on Digital Health and Imaging. Delivered in association with TalentSprint, this executive friendly in-depth and comprehensive programme is best suited for professionals creating cutting edge technology solutions in eHealth, Personalized Healthcare, BioTech, Medical Devices, Wearables, Digital Therapeutics and more.

About Indian Institute of Science

IISc (Indian Institute of Science) is the oldest and the finest higher education institute of its kind in India. It pursues excellence in research and education in several fields of Science and Engineering and is one of the first three publicly funded institutes to be awarded the Institute of Eminence status. The alumni of IISc hold significant academic and industry positions around the globe. For more information visit https://www.iisc.ac.in

The Programme will be delivered by IISc's Centre for Continuing Education (CCE). CCE delivers courses suitably designed to meet the requirements of target groups: Research & Development (R&D) Laboratories and Industries, Research Scientists/Engineers, to enable them to grow into competent managers of technology intensive and data-driven organizations. For more information visit http://cce.iisc.ac.in

India's #1 University by NIRF (2016-20)

2 Bharat Ratna Awardees (1954, 2014)

Times Higher Education #1 University in India (2020)

RUR World #62 (2020)

Learn from Leaders

Prof. Phaneendra Yalavarthy

Programme Coordinator

Ph.D. Engineering Sciences, Dartmouth College, USA

An Associate Professor at the Department of Computational and Data Sciences, IISc. and a Faculty Associate for Interdisciplinary Mathematical Sciences and Convenor for Medical Imaging Group, CDS at IISc. Subject expert in Computational methods in Medical Imaging, Medical Image Processing, and Physiological Signal Processing.

Prof. Jaya Prakash

Programme Faculty

Ph.D. Medical Imaging, Indian Institute of Science, India

Assistant Professor at the Department of Instrumentation and Applied Physics, IISc. His prior experience is with companies like Shell Technology Center, and iThera Medical-Munich. His key research areas include: Optical/Optoacoustic Imaging and Multi-Modal Imaging Systems.

Prof. Ambedkar Dukkipati

Programme Faculty

Ph.D. Indian Institute of Science, India

Associate Professor at Department of Computer Science and Automation, an IIT Madras and IISc alumni. His research interests include statistical network analysis, network representation learning, spectral graph methods, machine learning in low data regime, sequential decision-making under uncertainty and deep reinforcement learning.

Prof. Venkatesh Babu R

Programme Faculty

Ph.D. Electrical Engineering, Indian Institute of Science, India

A Professor in Computational and Data Sciences, IISc. He has held postdoctoral positions at Universities across Europe and worked in industry before taking active interest in academics. His research interests include: Signal Processing, Compression, Machine Vision, Image/Video Processing, Pattern Recognition and Multimedia.

Prof. Sriram Ganapathy

Programme Faculty

Ph.D. Speech Signal Processing, Johns Hopkins University, USA

Assistant Professor at the Department of Electrical Engineering, IISc. His research areas include: Signal Processing, Machine Learning, Deep Learning and Neuroscience with applications to Robust Speech Recognition, Speech Enhancement, Speech Coding and Audio Analytics including Biometrics.

Prof. Yogesh Simmhan

Programme Faculty

Ph.D. Computer Science, Indiana University, USA

An Associate Professor at the Department of Computational and Data Sciences, IISc. His research interests include: Temporal Graphs: Abstractions, Platforms and Algorithms, Edge Computing and Storage & Scalable Data Management and Analytics for Science and Engineering.

Curriculum and Format

Best Suited for Professionals having basic digital skills

Curriculum

Module-0: Bridge Module (Essential Math and Programming)**

**Strengthen your foundations in Math and Programming for your DeepTech learning journey. Know More

Module-1: Digital Health: Introduction

Pre-requisites: Understanding of Digital Technology

- Need, case studies, basics - mHealth and eHealth, Impact
- Informatics: Health Level Seven (HL7), Integrating the Healthcare Enterprise (IHE), Vendor Neutral Archives (VNAs)
- Open source/data/innovation - opportunities
- IT infrastructure (IoT/Cloud computing)

Module-2: Wearable Devices and Physiological Signal Processing

Pre-requisites: Basics of Signals & Systems, Basics of Fourier Transforms and Z-Transforms, Basics of Physiology.

- Signal Processing: Sampling, Basic Filters, Decimation, Interpolation, STFT, Wavelets
- Physiology: ECG Signal Acquisition (Electrical activity of heart, chest leads/montage, action potential in pacemaker and other regions; action potential relation to ECG Waveform; Reading ECG); EEG Signal Acquisition (Neural activity in the brain, Action potential, post-synaptic potential, Signal Propagation in the brain, EEG montage, EEG Signal Acquisition); EEG and ECG data processing
- Wearable Sensors for health monitoring: Accelerometers (data acquisition and interpretation), glucose sensing (acquisition methods and comparison), Wearable ECG & EEG based on dry electrodes
- Speech and audio signal processing: From signal capture to data pre-processing and feature modelling.

Module-3: Machine Learning Basics for Real-world

Pre-requisites: Basic of Probability and Linear Algebra: Bayes Theorem, Random Variables, Expectation, Variance, Matrices, Inverse, Eigenvalues and Eigenvectors

- Basic Mathematics for ML, What is Data and Model? Machine Learning Workflow and Applications
- Introduction to real-world signals - text, speech, image, video; Feature extraction and front-end signal processing - information-rich representations, robustness to noise and artifacts
- Learning as optimization, Linear Regression, Regularization and Logistic Regression
- Basics of pattern recognition, Generative modelling - Gaussian and mixture Gaussian models
- Machine Learning for physiological signal processing. Time series modelling

Module-4: Deep Learning in Digital Health

Pre-requisites: Basic Machine Learning that is part of Module 3

- Deep Learning: Basics, MLPs, Back propagation, CNNs
- Deep Learning for physiological signal processing. Recurrent neural models
- Discussion on Depth Versus Width. Practical considerations in Deep Learning. Avoiding Overfitting- R egularization, Dropout. Convolutional Neural Networks. Recurrent Neural Networks. Forward and Backward propagation. Various Architectures for sequence to sequence and sequence to vector mapping.
- Applications of Deep, Convolutional and Recurrent models in healthcare. (Instructor: SG)
- Nature Language Processing: LSTMs, Language Models, Knowledge Graphs, Q&A (Demo)

Module-5: Deep Learning in Imaging/Vision

Pre-requisites: Modules-1,2,3, and 4

- Medical Imaging Modalities: Introduction, Protocols, Work Flows, Applications
- Medical Image Analysis: Basics, Imaging Physics-Based Methods, and Need for Deep Learning & Neuroimaging: Introduction, Challenges
- Vision - Deep learning: Loss function, Optimization, CNNs, Training Convolutional Neural Networks, Object Detection, Segmentation
- Deep Learning models: AlexNet, VGG, GoogleNet, ResNet, RNN/LSTM

Python Refresher Sessions Included

Format

✓ 6 months ✓ Faculty-led Interactive Live Classes

Schedule

Interactive Online Classes

✓ Faculty-led Interactive Sessions ✓ Convenient Schedule

✓ Direct to Device

Classes on Saturdays & Sundays

What should you expect from this Programme?

Learn
Learn from Leading IISc Faculty

Reinforce
Reinforce Learning by Applying Concepts

Network
Network with Current and Future Digital Health Industry Practitioners

Certificate
Executive Programme Certificate by IISc


CENTRE FOR CONTINUING EDUCATION
INDIAN INSTITUTE OF SCIENCE
BENGALURU 560 012

Certificate of Completion

This is to certify that

has successfully completed the

Advanced Certification Program in Digital Health and Imaging

held during July 2020 - December 2020

Course Coordinator

Chairman/CCE

SAMPLE

Career Accelerator

TalentSprint's Career Accelerator offers real, tangible, and far-reaching career advancement and transformation solutions to program participants. At TalentSprint, we are committed to helping participants connect, explore, and empower their future.

Compelling Profile

Build a compelling professional profile with a DeepTech edge

Priority Career Access

Get priority access to career opportunities in the industry

Elite Community

Become a member of an exclusive community of DeepTech experts

Startup Mentorship

Boost your startup ideas with professional mentorship

Eligibility

- **Education:** Bachelors (four years or equivalent) or Masters in Science / Engineering / Medicine / Pharmacy / Management
- **Work Experience:** Relevant experience of 1 year

Strengthen your foundations in Math and Programming through the Bridge Module by TalentSprint.

Enrolment Process

1. **Apply for Programme**
2. **Submit Details**
3. **Await Selection**
4. **Join Programme**

Selection for the Programme will be done by IISc and is strictly based on education, work experience and motivation of the participants.

Fee

Details	Domestic Participants	International Participants
Programme Fee	₹2,40,000	$4,000
0% EMI and Scholarships are available. Please contact your Relationship Manager for details.		

Upon successful enrolment, the application fee of ₹1000 ($15) will be adjusted with the programme fee.

Fee paid is non-refundable and non-transferable.

GST as applicable

Get a complimentary Bridge Module worth ₹25,000 to strengthen your foundations in Math and Programming for your DeepTech learning journey.

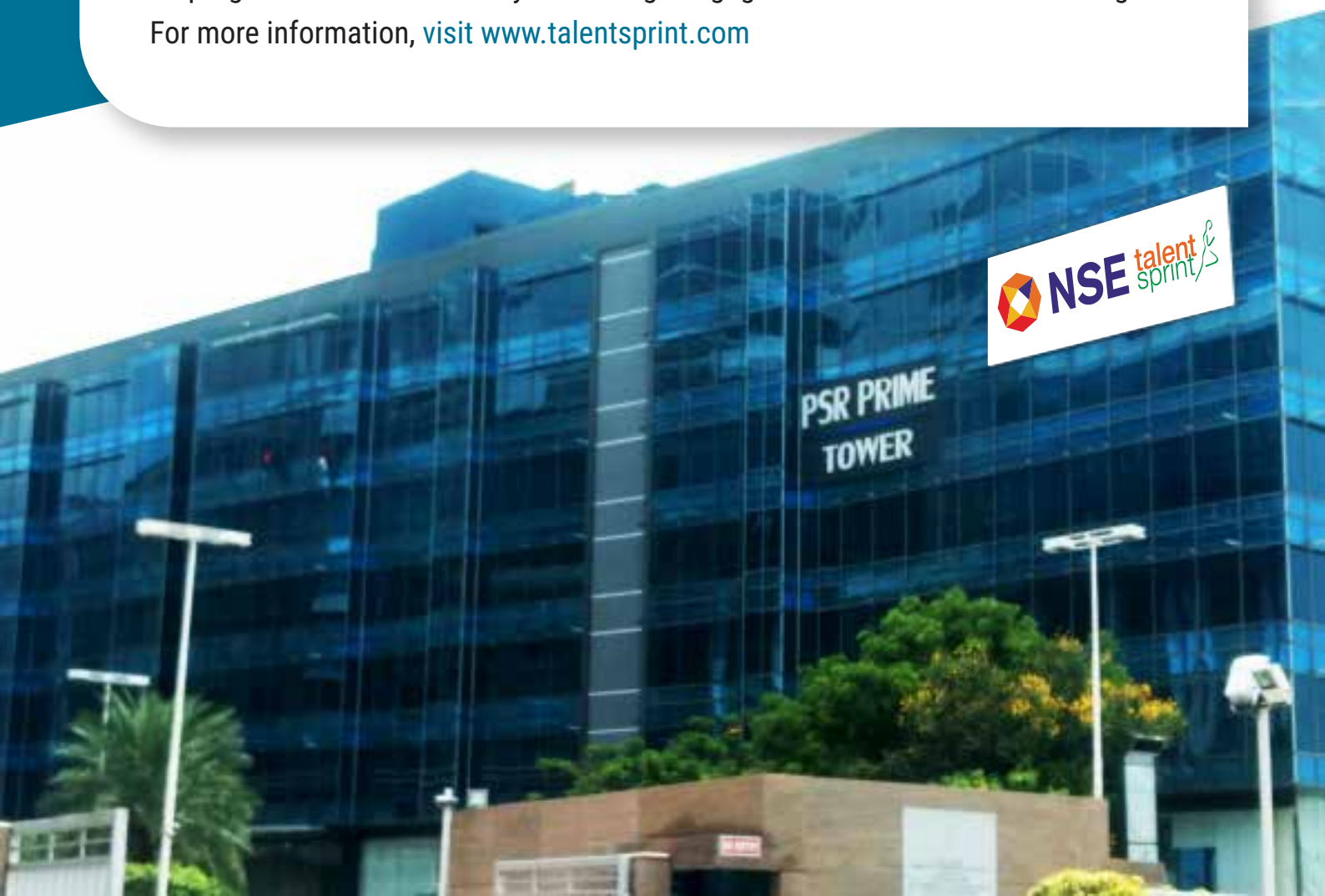
About TalentSprint

Best in Class Hybrid Platform

Industry Partnerships

Academic Partnerships

TalentSprint, a National Stock Exchange (NSE) Group Company, brings transformational high-end and deep-tech learning programs to emerging and experienced professionals in partnership with top academic institutions and global corporations. Its patent-pending, AI-powered, digital learning platform enables a perfect blend of high-end academics and industry-leading practitioner experience. Its programs have consistently seen a high engagement rate and customer delight. For more information, visit www.talentsprint.com



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Schedule

Live Online Sessions

- ✓ Faculty-led Interactive Sessions
- ✓ Convenient Schedule
- ✓ Direct to Device

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Contact Program RM for more details

Ramesh - 9154234704

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