Intel® Unnati
Data-Centric Labs in Emerging Technologies

Give Your Students the Intel Edge.

intel.

Today, there is a wide, and growing, skill gap between technical graduates and IT industry expectations. To propel India's digital economy transformation, it is imperative that the higher education system in the country bridges this gap by developing new curricula and offering courses in emerging technologies. The National Education Policy 2020[1] recognises this, and stresses the need for greater industry-academic linkages, and for higher education institutions to focus on research and innovation.

With the **Intel® Unnati Program**, you can keep pace with fast changing industry needs and expectations. It will help you:

Equip your students with industry relevant data-centric skills

In this age of data explosion, there is immense opportunity. Give your students the edge by equipping them with data-centric skills that will help them glean better insights and develop high-value solutions.

Unleash your students' creative potential

We, in India, have an incredible opportunity to unleash the creative potential of the largest student population in the world by training them in the right skills to drive India's digital transformation.

Build a strong reputation

With an Intel co-branded lab, you can be recognised as an institute that is committed to train your students in the latest technology to prepare them for industry, and focus on faculty development.

Build capability for the long term

Establish and maintain your leadership with the help of our **System Integrator Associates**. From Intel's recommendations for end-to-end technology labs set up and course content to training, customisations of your lab set up, or your maintenance and support requests, you can rely on them for all your needs.

[1]Ministry of Human Resource Development, Government of India, National Education Policy 2020, *https://static.pib.gov.in/WriteReadData/userfiles/NEP_Final_English_0.pdf*

Winning with the Intel® Unnati Community

With an Intel® Unnati Lab, you—and your faculty and students—become part of the **Intel® Unnati Community**, and get exclusive benefits:

- **Intel® Unnati Grand Challenge**, where students solve industry relevant, high impact problems through technology, with cash awards and the opportunity to be evaluated for internships at Intel
- **Intel® Unnati Ignite** workshops that offer hands-on experience with Intel technologies
- **Intel® Unnati Catalyst** co-sponsorships of events focused on new technologies
- **Intel® Unnati Industrial Training**, where qualifying students work for a month on industry relevant problems under the guidance of industry mentors
- **Intel® Unnati Research Launchpad**, which offers grants to faculty members for original research in new and emerging technologies

Intel® Unnati

Artificial Intelligence

Build a Strong Foundation in AI

Understand Machine Learning (ML) and Deep Learning (DL) concepts from the ground up. Work through an end to end workflow to get practical understanding of what to expect when building AI solutions.
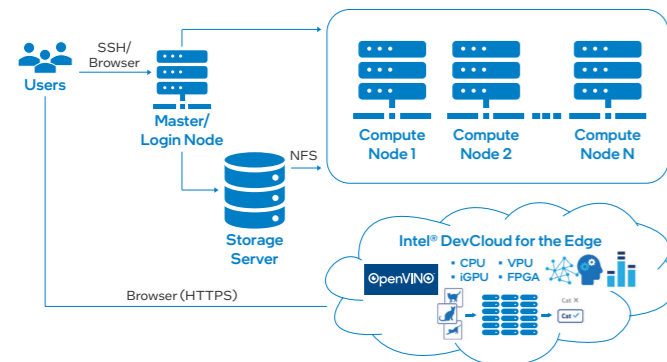
Get Ready for Edge Computing

Students learn how to deploy models targeting CPU, Integrated GPU, VPU, and FPGA, and to use pretrained models to accelerate development time.

Student-Centric UX

Students get a consistent learning experience no matter where they are, and can easily execute course exercises by connecting to their lab network using any PC—they just need a modern browser.

Towards a Digital Economy Powered by Data-Centric Skills

India aims to become a $1 trillion digital economy by 2025, and this requires significant investment in 21st century infrastructure and software capabilities.[2]

The value pool is fundamentally shifting away from legacy technologies and towards digital—automation, cloud, cybersecurity, mobile, artificial intelligence (AI), 3-D printing, internet of things (IoT), big data analytics, and social media—at a pace even faster than anticipated just a few years ago. To emerge as an Information Technology and Business-Process Management (IT-BPM) leader, India needs to prepare people to develop advanced capabilities in these technologies.[2]

Enhancing the curriculum in higher education so that students and faculty are equipped with these data-centric skills is an important foundational element to make progress on this digital transformation journey.

[2]https://meity.gov.in/writereaddata/files/india_trillion-dollar_digital_opportunity.pdf

Showcase New Skills

Students are awarded an Intel co-branded certificate at the completion of their course.

Coursework that Enables Learning by Doing

With an emphasis on hands-on exercises, the course covers Machine Learning, Deep Learning, and Deploying Models using Intel Distribution of OpenVino™ toolkit on modern Intel® architecture.

Custom Lab Deployments

Our System Integrator associates will assist you for customisations to your lab setup and training content to suit your needs.

Intel AI

Artificial Intelligence has unleashed a new era of creativity and ingenuity. Today, Intel® technologies power some of the most promising AI use cases in business, society, and research. From massive cloud to tiny device, Intel turns the promise of a transformative AI model into a global-scale reality.

Intel's portfolio of Xeon® scalable processors, combined with AI-optimised FPGAs, VPUs, memory and storage technologies, and software solutions ease the process for deploying AI and data analytics in real-world applications.

Intel is committed to unlocking the promise of AI. To drive AI innovation, Intel is making strategic investments spanning R&D, technology, and partnerships with business, government, academia and community groups.

AI Builder Lab

For institutions that are seeking to go beyond lab exercises and invest in the next generation of AI Builders

Minimum Suggested Specifications

Hardware				Software
Server/Workstation	**Component**	**Product Description**	**Quantity per System**	
▪ 1 x Master Node	Memory	32GB RDIMM, 1 Rank, 4800MHz	8	▪ Ubuntu* 18.04
	Processor	Intel® Xeon® Silver 4410, 12 Core, 2 GHz, 150W	2	▪ Intel® oneAPI Base Toolkit
	Management Key Options	Advanced System Management Key	1	▪ Intel® AI Analytics Toolkit
	Power Supply	1300W Power Supply	2	▪ Horovod* + Intel® MPI (for distributed DLtraining with TensorFlow*)
	Dual Hyper Hybrid Controller	M.2 Card RT3EX020E with HW RAID	1	
	TPM	Version 2.0	1	▪ Intel® Extension for PyTorch* (IPEX)
	M.2 Drive	480GB SATA	2	
	Front Bay 1, Drive 01	1.92T 2.5 NVME4	1	▪ Intel® Distribution of OpenVINO™ Toolkit
	Onboard NVME Cable 1	Cable Kit CBLMCSL1204KIT	1	
	Networking IO Modules	X710-T2L for OCP 3.0	1	▪ JupyterHub* and JupyterLab*
	+ Heat sink, Riser Card, Rail Option (Please discuss with System Integrator for options)			▪ Keras*, ipykernel*, Seaborn*
▪ Minimum 2 x Compute Nodes	Memory	32GB RDIMM, 1 Rank, 4800MHz	8	+ other libs as required by exercises
	Processor	Intel® Xeon® Gold 6430, 32 Core, 2.1 GHz, 270W	2	**Note:** Check https:// software.intel.com/ containers for available AI containers
	Management Key Options	Advanced System Management Key	1	
	Power Supply	1300W Power Supply	2	
	Dual Hyper Hybrid Controller	M.2 Card RT3EX020E with HW RAID	1	
	TPM	Version 2.0	1	
	M.2 Drive	480GB SATA	2	
	Front Bay 1, Drive	Front Bay 1, Drive	1	
	SATA Cable	1.92T 2.5 NVME4	1	
	Networking IO Modules	X710-T2L for OCP 3.0	1	
	+ Heat sink, Riser Card, Rail Option (Please discuss with System Integrator for options)			

AI Builder Lab (continued)

Hardware				Software
Server/Workstation	**Component**	**Product Description**	**Quantity per System**	
▪ 1 x Storage Server	2 TB space (or as per requirements)		1	
▪ Network Router with 10Gbps Ports, Network Switch, Rack Cabinet, Power Delivery Unit (PDU), Patch Cables and Power Cable ▪ Intel® OpenVino™ labs will be run on Intel® DevCloud for the Edge				Software for job scheduling and queueing

AI Research Lab

For institutions that are seeking to build high-end research facilities for solving problems using AI

Minimum Suggested Specifications

Hardware				Software
Server/Workstation	**Component**	**Product Description**	**Quantity per System**	▪ Ubuntu* 18.04 ▪ Intel® oneAPI Base Toolkit ▪ Intel® AI Analytics Toolkit ▪ Horovod* + Intel® MPI (for distributed DL training with TensorFlow*) ▪ Intel® Extension for PyTorch* (IPEX) ▪ Intel® Distribution of OpenVINO™ Toolkit ▪ JupyterHub* and JupyterLab* ▪ Keras*, ipykernel*, Seaborn* + other libs as required by exercises **Note:** Check *https://software.intel.com/* containers for available AI containers
▪ 1 x Master Node	Memory	32GB RDIMM, 1 Rank, 4800MHz	8	
	Processor	Intel® Xeon® Silver 4410, 12 Core, 2 GHz, 150W	2	
	Management Key Options	Advanced System Management Key	1	
	Power Supply	1300W Power Supply	2	
	Dual Hyper Hybrid Controller	M.2 Card RT3EX020E with HW RAID	1	
	TPM	Version 2.0	1	
	M.2 Drive	480GB SATA	2	
	Front Bay 1, Drive 01	1.92T 2.5 NVME4	1	
	Onboard NVME Cable 1	Cable Kit CBLMCSL1204KIT	1	
	Networking IO Modules	X710-T2L for OCP 3.0	1	
	+ Heat sink, Riser Card, Rail Option (Please discuss with System Integrator for options)			
▪ Minimum 6 x Compute Nodes	Memory	32GB RDIMM, 1 Rank, 4800MHz	8	
	Processor	Intel® Xeon® Gold 6430, 32 Core, 2.1 GHz, 270W	2	
	Management Key Options	Advanced System Management Key	1	
	Power Supply	1300W Power Supply	2	
	Dual Hyper Hybrid Controller	M.2 Card RT3EX020E with HW RAID	1	
	TPM	Version 2.0	1	
	M.2 Drive	480GB SATA	2	
	Front Bay 1, Drive 01	1.92T 2.5 NVME4	1	
	SATA Cable	Cable Kit CYPCBLHDHDXXX1	1	
	Networking IO Modules	X710-T2L for OCP 3.0	1	
	+ Heat sink, Riser Card, Rail Option (Please discuss with System Integrator for options)			

Intel® Unnati Data-Centric Labs are built around **4th Gen Intel® Xeon® Scalable Processors**, which offer a balanced architecture that delivers built-in AI acceleration and advanced security capabilities.

Compared to the prior generation of processors, they are:

Made for efficient encryption: They encrypt data with Intel® QuickAssist Technology **using up to 47% fewer cores** at the same performance level.

Built for blazing AI processing: They offer **10-fold higher PyTorch real-time interference and training performance**.

Designed for cost-efficient data centres: They **significantly reduce Total Cost of Ownership (TCO)**: 52% for databases, 55% for AI real-time referencing and 66% for high-performance compute.

AI Research Lab (continued)

Hardware				Software
Server/Workstation	**Component**	**Product Description**	**Quantity per System**	
▪ 1 x FPGA Inference Node (only Qualified Servers: refer *https://www.intel.com/content/www/us/en/programmable/products/boards_and_kits/dev-kits/altera/acceleration-card-arria-10-gx/buy.html*)	Memory	32GB RDIMM, 1 Rank, 4800MHz	8	▪ Ubuntu* 18.04 ▪ Intel® oneAPI Base Toolkit ▪ Intel® AI Analytics Toolkit ▪ Intel® FPGA Add-On for oneAPI Base Toolkit ▪ Intel® Distribution of OpenVINO™ Toolkit (LTS Release only)
	Processor	Intel® Xeon® Gold 6430, 32 Core, 2.1 GHz, 270W	2	
	Management Key Options	Advanced System Management Key	1	
	Power Supply	1300W Power Supply	1	
	High-Power Adapter 1	PAC with Intel Agilex® 7 FPGA	2	
	Dual Hyper Hybrid Controller	M.2 Card RT3EX020E with HW RAID	1	
	TPM	Version 2.0	1	
	M.2 Drive	480GB SATA		
	Front Bay 1, Drive 01	1.92T 2.5 NVME4	1	
	SATA Cable	Cable Kit CYPCBLHDHDXXX1	1	
	Networking IO Modules	X710-T2L for OCP 3.0	1	
	+ Heat sink, Riser Card, Rail Option (Please discuss with System Integrator for options)			
▪ 1 x GPU Node (Optional)	Memory	32GB RDIMM, 1 Rank, 4800MHz	8	▪ Ubuntu* 18.04 ▪ Intel® oneAPI Base Toolkit ▪ Intel® AI Analytics Toolkit ▪ Intel® Distribution of OpenVINO™ Toolkit
	Processor	Intel® Xeon® Gold 6438, 32 Core, 2.3 GHz, 205W	2	
	GPU	Intel® Data Center GPU Max 1100	1 or 2	
	Management Key Options	Advanced System Management Key	1	

AI Research Lab (continued)

Minimum Suggested Specifications				
Hardware				**Software**
Server/Workstation	**Component**	**Product Description**	**Quantity per System**	
▪ 1 x GPU Node (Optional) *(continued)*	Accelerator Card	Intel® Vision Accelerator Design With Intel® Movidius™ Vision Processing Unit with support for up to 8 VPUs	2	
	Power Supply	1300W Power Supply	2	
	Dual Hyper Hybrid Controller	M.2 Card RT3EX020E with HW RAID	1	
	TPM	Version 2.0	1	
	M.2 Drive	480GB SATA	2	
	Front Bay 1, Drive 01	1.92T 2.5 NVME4	1	
	SATA Cable	Cable Kit CYPCBLHDHDXXX1	1	
	Networking IO Modules	X710-T2L for OCP 3.0	1	
	+ Heat sink, Riser Card, Rail Option (Please discuss with System Integrator for options)			
▪ 1 x Storage Server	50 TB space (or as per requirements)		1	
▪ Primary Interconnect: 36-port 100 Gbps Infiniband/OPA switch with rail kit and 2PSU ▪ Secondary Interconnect: 24-Port 10 GbE Ethernet switch with required number of 2m CAT6 cables				▪ Software for job scheduling and queueing

To know more about how your institution can benefit from the Intel® Unnati Program, please contact:

intel.