

COMPUTING &  
ANALYTICS

@NSHM





# NSHM Knowledge Campus

Life is full of possibilities. All you need to do is explore them. At NSHM, we provide our students with the perfect environment to explore the world of unlimited possibilities and craft their own success story across multiple faculties like Business & Management, Media & Design, Health Sciences, Computing & Data Analytics, Tourism & Hotel Management and Engineering & Technology.

Today, NSHM has earned a nationwide reputation for its innovative approach to learning. It offers the best industry integrated learning, internships and top-of-the-line placements. The students are provided with theoretical, as well as practical learning, aided with hi-tech labs and infrastructure. Professional and scholarly ambience along with a fulfilling campus life ensures an all-round development of the students.

# Our Legacy



Winner of ASSOCHAM India Award for  
Best Education Group in the East, 2018



# 50 10 @

Degree Courses

Disciplines

More than  
**25,000**

alumni working in India and abroad

# Experiential Learning

# Schools



## Business & Management

MBA  
MBA (P.T.)  
PGDM  
BBA  
BBA (Supply Chain Management)  
BBA (Sports Management)  
BBA (Global Business)

## Computing & Data Analytics

BCA  
B.Sc. in Gaming & Mobile  
Application Development  
M.Sc. in Data Science & Analytics  
M.Sc. in Information & Cyber Security  
M.Sc. in Computer Science

## Media & Design

B.Sc. in Media Science  
M.Sc. in Media Science  
B.Sc. in Fashion Design & Management  
B.Sc. in Multimedia, Animation & Graphics  
B.Sc. in Interior Designing  
M.Sc. in Fashion Management  
M.Sc. in Visual Communication  
M.Sc. in Digital Films

## Tourism & Hotel Management

Bachelor of Hotel Management  
Bachelor in Hotel Management &  
Catering Technology  
B.Sc. in Culinary Science  
M.Sc. in Hospitality Management  
Bachelor in Travel & Tourism Management (BTTM)  
Masters of Tourism & Travel Management (MTTM)

## Health Sciences

B. Pharm. | M. Pharm.  
BBA (Hospital Management)  
MHA (Master of Hospital Administration)  
Master in Public Health  
B.Optom. | M.Optom.  
B.Sc. in Medical Lab Technology  
B.Sc. in Behavioral Science & Applied Psychology  
M.Sc. in Clinical Psychology  
M.Sc. in Dietetics & Nutrition

## Engineering & Technology

B.Tech. - Electrical Engineering  
B.Tech. - Civil Engineering  
B.Tech. - Electronics & Communication Engineering  
B.Tech. - Computer Sc. & Engineering  
B.Tech. - Mechanical Engineering  
M.Tech. - Electronics & Communication Engineering  
Diploma - Civil Engineering  
Diploma - Mechanical Engineering



# Computing & Data Analytics

India is the world's largest sourcing destination for the Information Technology (IT) industry, and is estimated to expand at a CAGR of 9.5% to USD 300 billion by 2020. This sector is in need of a constant influx of professionals trained in global industry practices who should have the ability to adapt to its constantly evolving demands.

Similarly the Data Analytics Industry demands is also expected to shoot through the roof in the coming years. With Big Data showing no signs of pulling up, there's a rush among global giants to hire Data Analytics and Scientists to tame their business critical Big Data corpus.

So, those opting to graduate in these disciplines will be equipped with analytical and technical knowledge that is according to the latest trends & practices of their respective industries which is primarily driven by innovation.





# Extended Learning Framework

## Computing and Data Analytics

Bachelor Degree Programs	Master Degree Programs
BCA B.Sc. in Gaming and Mobile Application Development	M.Sc. in Computer Science M.Sc. in Data Science & Analytics M.Sc. in Information and Cyber Security
MOOCs [NPTEL/Swayam/Coursera etc. approved and notified by Department]	
[ Any 4 ] 1. Introduction to Information Security - I 2. Learn to Program: The Fundamentals 3. Programming for Everybody (Getting started with Python) 4. Introduction to Game Design 5. Build your first Android App (Project-Centered Course) 6. Programming, Data Structures and Algorithms using Python 7. Information Security - II 8. Technical Support Fundamentals 9. Introduction to Cyber Security Specialization 10. CODAPPS: Coding mobile apps for entrepreneurs 11. Introduction to programming with MATLAB 12. Social Network	[ Any 5 ] 1. Design and Analysis of Algorithms 2. Introduction to the Internet of Things and Embedded Systems 3. A Crash Course in Data Science 4. Information Security: Context and Introduction 5. Introduction to Human Computer Interaction 6. Real Time Operating System 7. Artificial Intelligence: Knowledge Representation & Reasoning 8. Embedded Systems Design 9. Cloud Computing 10. Cryptography & Network Security 11. Data Mining 12. Introduction to Soft Computing 13. Bitcoin and Cryptocurrency Technologies
Faculty Guided International Study Program – [Costs to be borne by participant as per actual]	
Optional [Semester 2 event with prior notification]	Optional [Semester 2 event with prior notification]
Industry-Institute Collaboration	
<ul style="list-style-type: none"> <li>- Incubation facilities and start-up support in areas of – Game Development, IoT, Mobile Apps, Software Solutions etc.</li> <li>- Modeling and Prototype development with Intellectual Property Management Support</li> <li>- GEP ( Global Employability Program) with Industry Certifications in each year [mandatory – with subsidized payment ₹1500-2500]/participant]</li> <li>- Internship, Placement , Technology Development &amp; Transfer Assistance</li> </ul>	
Student Initiatives (Technical)	
<ul style="list-style-type: none"> <li>- Annual Students Paper/Poster Presentations on notified technical theme</li> <li>- Information, Education and Communication (IEC) content development and dissemination</li> <li>- 1 relevant Journal Paper or 1relevant Seminar/Conference Presentation /PG participant</li> <li>- Inter-College Hackathon event [Programming and Collaborative Development - 3 days event]</li> </ul>	
Student Initiatives (Social)	
<ul style="list-style-type: none"> <li>- NSS related activity</li> <li>- Anti-ragging, Clean India, Digital India, Teach India etc. campaign participation in national interest</li> <li>- Fests, Adventure, Sports, Literary, Cultural and other extra-curricular events</li> </ul>	

The above framework is at best a tentative template on extended learning framework for 2018-19 registered UG and PG students of above mentioned programs and the deliverables may get altered from time to time in the milieu of fast-changing industry dynamics.







# Computing & Data Analytics

**BCA (Bachelor of Computer Application)**

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**B.Sc. in Gaming & Mobile Application Development**

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**M.Sc. in Computer Science**

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**M.Sc. in Data Science & Analytics**

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**M.Sc. in Information & Cyber Security**

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## Career Direction

The courses provide a plethora of career options for the student to explore in IT and analytics. Some of them are:

Advertising Graphics

Animation

AI Product Designer & Manager

Big Data Analysts

BPO/ITES

Business Intelligence

Content Provider

Cloud Computing

Computer Games Designing

Computer and Data Processing Services

Computer System Analysis

Computer Technical Support

Cryptographic Expert

Cyber Legal Service

Data Analysis

Data Mining or Big Data Engineer

Data Scientist

Data Warehousing

Database Administration

Database Development

Demographics

Equity Quantitative Analysis

Ethical Hacking

Financial Advising

Forensic Expert

Freelancer/Entrepreneur

Graphic Artist

Hardware/Software Design and Development

Interactive Visual Designer

Internet of Things

IT Consultancy

IT Infrastructure Management

Machine Intelligence

Mobile App Development

Multimedia Professionals/Flash Developers

New Media

Network Security & Network Engineering

Networking and Systems Administration

Operations Research Analysis

OS Development

Penetration Tester

Program/Project Manager-  
massive data management  
in networked environments

Programming and Development

Publishing Houses

Quantitative Risk Analysis

Research

Security Code Auditor

Security Software Developer

Software Engineering

Software Project Management

Software Quality Management

Software Testing

Solution Architect

Statistics

System Integration

Sound Experts

Teaching/Trainer

Treasury Management

User Experience Researcher

Web Programming & Designing

## Placement

The placement cell works round the year to create internship and placement opportunities for the students.

The logo for UNISYS, featuring the word "UNISYS" in a bold, red, serif font.The logo for Tech Mahindra, with "Tech" in a grey, sans-serif font and "Mahindra" in a red, sans-serif font below it.The logo for SAP, featuring the word "SAP" in a white, sans-serif font on a blue rectangular background.The logo for Amazon, with the word "amazon" in a lowercase, sans-serif font and a curved orange arrow underneath it.The logo for Accenture, with the word "accenture" in a lowercase, sans-serif font and a blue chevron symbol above the letter "u".The logo for Atos, featuring the word "Atos" in a blue, sans-serif font.The logo for Cognizant, featuring a blue and green circular icon with a white "C" and the word "Cognizant" in a sans-serif font to its right.The logo for Infosys, with the word "Infosys" in a blue, sans-serif font.The logo for CTS, with the letters "CTS" in a blue, sans-serif font and a small green and orange square icon above the letter "S".The logo for IBM, consisting of the letters "IBM" in a blue, striped, sans-serif font.The logo for Capgemini, with the word "Capgemini" in a blue, sans-serif font and a blue circular icon with a white dot to its right.The logo for HCL INFOSYSTEMS, with the word "HCL" in a white, sans-serif font on a blue rectangular background, and "HCL INFOSYSTEMS" in a smaller, sans-serif font below it.The logo for flipkart.com, with the word "flipkart" in a white, sans-serif font on a blue rectangular background, and ".com" in a smaller, sans-serif font to its right.

## Alumni



**Akashdeep Keshri**  
Capgemini

At NSHM, learning is indeed an experience in itself. The program was designed to make me industry-ready from day one. I received immense support and guidance from the teachers.



**Ojas Mansata**  
Cognizant

The most memorable years of my life were spent at NSHM. The course helped me to learn the ropes of the industry within such a short span of time.



**Saif Alam Khan**  
Deloitte

Life in the corporate world is very unpredictable. But I am well prepared. Thanks to the wonderful guidance provided by NSHM. The theoretical and practical knowledge helped me immensely in my profession.



**Swati Pritam**  
Accenture

At NSHM, I have been on a journey towards selfimprovement and learning. Life here is full of opportunities and experiences that helped in building my overall personality. Unconditional support and help from faculties helped me to become a better professional.



**Nikita Anupama**  
Infosys

NSHM has inspired me in various aspects of my life and has taught me to strive for the best. The whole experience cannot be put in words. This program has developed my confidence and has given me a new direction towards life.



**Amit Kumar Barnwal**  
Tata Consultancy Services

I will always be grateful to NSHM and my teachers who motivated me and guided me. Interacting with the industry experts and getting the opportunity to learn from them made me confident and capable. My days at NSHM is something I will always cherish.



**Arshia Shahid**  
Amazon

Being at NSHM was a once in a lifetime experience. Abundance of positivity and encouragement from the faculty members helped me to pursue my dreams. The theoretical and practical knowledge helped me immensely.



**Shirsendu Mahata**  
Concentrix

Early industry exposure and training has helped me immensely. Every aspect of the course was designed to enhance and develop my skills. The mentors helped and supported me in achieving my goals.





# Experiential Learning



## Comprehensive Skill Development Programs

BCA students are provided training in ASP.NET and MySQL Integrated Development, PHP and MySQL Integrated Development and Android Application Development. Special training is also offered in co-curricular areas like Web Application Development, Android Application, Parallel Programming using Cud, Information Security & Ethical Hacking, Python, etc.

## Research & Development Activities

The state-of-the-art hardware and software labs offer the students hands-on training in Embedded System Design, Mobile Computing and Image Processing. Currently, there are three research and development teams working on Cryptography, Reconfigurable Computing and Embedded Design & Image Processing. The departmental library is also rich with national and international publications and journals.

## National Program for Technology Enabled Learning (NPTEL)

NPTEL offers open online courses on emerging technologies to the students which help them enhance their employability skills.

## Co-curricular Activities

The college encourages students to join clubs like photography, cultural, debating, nature, adventure sports and training etc.

## Employability Program

This program keeps our students abreast of the happenings in the international job market. In addition to gaining in-depth knowledge in their respective curriculums, the students get a definitive edge for higher employability.

## Knowledge Partners

Data Science - Analytics Society of India (DCAL, IIM, Bangalore)  
IoT - Subex, Bangalore and CDAC, Bangalore  
Security - CyberOps, Jaipur; National Cyber Safety & Security Standards, Delhi and Quick Heal, Pune

# BCA (Bachelor of Computer Application)

Degree awarded by MAKAUT (formerly known as WBUT)

Duration: Three years (full time)

Eligibility: 10+2 passed from any board with English and Mathematics/Statistics/Business Mathematics/Computer Science as subjects.

Selection will be strictly through combined entrance test conducted by MAKAUT and/or NSHM and personal interview.



## Course Module

### First Year

Digital Electronics

Business Systems and Applications

Introduction to Programming Mathematics

Computer Architecture and Systems Software

Information Systems Analysis and Design

Computer Programming (Visual Basic)

### Second Year

Operating Systems

Database Management System

Data Structures in C

Object Oriented Programming with C++

Graphics and Internet

Software Project Management and Quality Assurance

Mathematics for Computing Statistics

Numerical Methods & Algorithm

### Third Year

Data Communication and Computer Networks

Advanced Networking and Communication

Intelligent Systems

Image Processing

Advanced Unix and Shell Programming

Human Computer Interaction

Multimedia & E-Commerce

Software Engineering

Object Oriented Programming with Java

Advanced Database Management

Windows Programming

Major Project Unix & Shell Programming

Seminar Minor Project



# B.Sc. in Gaming & Mobile Application Development



Degree awarded by MAKAUT  
(formerly known as WBUT)

Duration: Three years (full time)

Eligibility: 10+2 passed with individual pass mark  
in Mathematics/Computer Science as a paper.

Selection will be strictly through combined  
entrance test conducted by MAKAUT and/or  
NSHM and personal interview.

## Course Overview

This course shall create IT professionals for emerging avenues in Game Designing/Development/Programming and in various other sectors of economy in information and cyber age.

## Course Module

### First Year

English  
Engineering Math  
Computer Architecture  
Environmental Science  
Fundamentals of Programming  
C Programming Lab  
Introduction to Linux Programming Lab  
Advanced Engineering Math  
Fundamentals of DBMS  
Network Fundamentals  
Object Oriented Programming  
Operating System Concepts  
OOP through C++/JAVA Lab  
Advanced Linux Programming Et Networking

### Third Year

Computer Vision Et Pattern Recognition (Image Processing)  
Natural Language Understanding  
Robotics Et Perception  
Knowledge based AI  
Game AI  
MATLAB Programming Lab  
Game Et Mobile Application Development Lab -2  
Project

### Second Year

Fundamentals of Data Structure  
Fundamentals of Game Physics  
Design Et Analysis of Algorithm  
System Analysis Et Design  
Computer Graphics Et Animation  
Data Structure through C Lab  
Graphics Programming Lab using Open GL Et others  
Advanced Data Structure  
Introduction to Game Development  
Mobile Application Development  
AI Basics (Problem Solving, Planning, Uncertain Knowledge Et Reasoning, Learning)  
Searching Et Optimization  
Advanced Data Structure Lab  
Game Et Mobile Application Development Lab-1



# M.Sc. in Computer Science

Degree awarded by MAKAUT (formerly known as WBUT)

Duration: Two Years (full time)

Eligibility: Bachelor in Computer Application/Computer Science/Engineering/any other relevant discipline.

## Course Module

### First Year

Principles of Programming Languages

Advanced DBMS

Information Systems & Software Engineering

Discrete Mathematics & Numerical Methods

Programming Lab (C)

Corporate Culture & Communication

Advanced DBMS Lab

Object Oriented Analysis and Design

Data Structure and Analysis of Algorithm

Advanced Computer Architecture

Data Communication and Networking

Object Oriented Programming Lab using Java

Data Structure Lab

Microprocessor Lab

### Second Year

Operations Research

Advanced Operating System

Artificial Intelligence

OR Lab

OS Lab (Unix)

Electives and Dissertation

**Elective Subjects:** Embedded Systems, Image Processing, Automata & Natural Language Processing, Cloud Computing, Mobile Computing, Network Security, Data Warehousing and Mining, Soft Computing, Social Network Analysis



# M.Sc. in Data Science & Analytics

Degree awarded by MAKAUT (formerly known as WBUT)

Duration: Two years (full time)

Eligibility: Bachelor in Engineering/Science with  
Mathematics as a core paper

## Course Overview

This course shall create experts as data scientists and analysts, capable of working with the massive amount of data that is now common to many businesses.

## Course Module

### First Year

Statistical Methods

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Advanced DBMS

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Advanced Operating System

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Operation Research

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Design and Analysis of Algorithms

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Advanced DBMS Lab

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OS Lab using Linux/Unix

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Modeling Techniques

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Object Oriented Analysis and Design

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Advanced Computer Architecture

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Data Communication and Networking

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Cloud Computing

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Object Oriented Programming Lab using Java

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Statistics Lab (using R)

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### Second Year

Time Series Analysis and Forecasting

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Data Warehousing and Mining

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Big Data Technology

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Data Collection and Visualization

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Application of Data Mining & Clustering

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Data Mining Lab using Python

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Big Data Technology Lab

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Elective-I

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Elective-II

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Major Project

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Grand Viva

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# M.Sc. in Information and Cyber Security

Degree awarded by MAKAUT (formerly known as WBUT)

Duration: Two years (full time)

Eligibility: Bachelor in Engineering/Science



## Course Overview

The goal of this course is for students to maintain an appropriate level of awareness, knowledge and skill in the disciplines of technology, business and law to allow them to minimize the occurrence and severity of information security incidents.

The students will learn techniques used to detect, respond to, and prevent network intrusions. The course will provide students with an in-depth understanding of core concepts with major thrust on functional competencies related to real life situations. The course bears a strong adherence to computer based technological skills and capabilities, and thereby resulting in efficiency of handling a variety of issues related to Information and Cyber Security in any organization.

## Course Module

### First Year

C Programming and Data Structure
Information Systems & Software Engineering
Fundamentals of Information Security and Legal Framework
Introduction to Hardware, Network & the Internet
Cyber Threat and Modeling
Computer LAB (MATLAB, Excel, Linux Server- Apache)
Cyber Crimes & Investigation
Network Security (Ref: WBUT MCSE 401C)
Application and System Security
Operating System, Database and Infrastructure Security
Cyber Forensics
Cyber Forensics Lab

### Second Year

Information Security & Cryptography
Mobile, Wireless and VoIP Security
Malware Analysis
Cyber Law
Security Architecture and Models
Cryptography Lab
Elective I
Elective II
Security Policy & Audit
Block Chain
Sessional Project
Grand Viva
Elective I
Cloud Computing
Mobile & Digital Forensics
Penetration Testing & Vulnerability Assessment
Elective II
Risk Management
Hardware Security
Biometric Security



# Events & Activities



## SAMAVESH - Annual Parents' Meet

The event saw the students put up an enchanting cultural evening for the parents. Few students also received merit awards from esteemed invitees.



## NSHM Bondhu Campaign

NSHM students collected new clothes for donating to the underprivileged children during Durgotsav to foster the spirit of festivity and joy.

## Launch of ASI, Kolkata Chapter

Professor Dinesh Kumar, IIM-Bangalore & Head, DACL and founding member of ASI launched Analytics Society of India, Kolkata Chapter at NSHM.





## Internet of Things (IoT): Technology Trends and Challenges

Department of Computer Application of NSHM, Kolkata had organized a one day knowledge camp titled "Internet of Things (IoT): Technology Trends and Challenges".



## Session on Cryptography & Ad-hoc Networking

An interactive lecture session on Cryptography and ad-hoc networking was delivered by Prof. Dipankar Chatterjee from India Statistical Institute, Giridih.

## Career counseling program for school students

Department of Computer Applications conducted psychometric tests for class XII students from Durgapur, Asansol and Burdwan and also conducted career counseling session.

## Login Astitwa - Freshers' Welcome

A two-day cultural extravaganza, organized every year which comprises of the freshers' welcome and the inter college fest.





### Disclaimer:

This information booklet of NSHM Knowledge Campus was published in March 2019, and the information given was correct at that time. It is intended primarily for those considering admission to the college in the year 2019. We reserve the right to modify any statement if necessary, to make variations to this content or methods of delivery of programs of study, to discontinue programs or to merge or combine programs. If such action is reasonably considered by the college, every effort will be made not to do so, notice of any changes will be given and the college will use all reasonable endeavors to provide a suitable alternative. Information about specific entrance requirements is intended as a guide only. For campus-specific details, please visit the respective NSHM Knowledge Campus at Kolkata and Durgapur. All disputes are to be settled within the jurisdiction of Kolkata for all NSHM Knowledge Campuses

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