4 Years B.S Programme in

Artificial Intelligence and Cyber Security (AICS)

COURSE STRUCTURE

SEMESTER I

Code	Course Name	L-T-P-Credits
BO ACS 101	**Mathematics - I**	3-1-0-4
BO ACS 103	**Foundations of Computer Science**	3-1-2-5
BO ACS 105	**Foundations of Data Analytics**	3-1-2-5
BO ACS 107	**Foundations of English for Professionals**	3-2-0-5
	Total Credits	19

SEMESTER II

Code	Course Name	L-T-P-Credits
BO ACS 102	**Mathematics - II**	3-1-0-4
BO ACS 104	**Programming and Data Structures with Python**	3-1-2-5
BO ACS 106	**Numerical Methods for Data Science**	3-1-2-5
BO ACS 108	**Capstone Project - I**	0-0-12-6
	Total Credits	20

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SEMESTER III

Code	Course Name	L-T-P-Credits
BO ACS 201	**Foundations of Cyber Security**	3-1-2-5
BO ACS 203	**Design of Algorithms**	3-1-2-5
BO ACS 205	**Machine Learning Techniques**	3-1-2-5
BO ACS 207	**Financial Economics**	3-1-0-4
	Total Credits	19

SEMESTER IV

Code	Course Name	L-T-P-Credits
BO ACS 202	**Database Management**	3-1-2-5
BO ACS 204	**Computer Organization**	3-1-2-5
BO ACS 206	**Cyber Security Essentials**	3-1-2-5
BO ACS 208	**Web Development and App Design**	3-1-2-5
	Total Credits	20

Mandatory **BO ACS 210: Summer Industry Project (12 credits)**: To work on a project relevant to Industry/contemporary problems of Industrial significance for award of Diploma and/or entering to the third year for the degree module.

This project aims to enable a candidate to identify a fundamental problem of valuable practical significance for the industry and work towards its viable solution. Students will work on a specified project, in online/offline mode, under a mentor from academia and/or industry for a period expending up to three months after completion of the fourth semester. There will be a project evaluation committee which will examine the students after completion of his/her project for awarding grades. The instruments of assessment will be the final project report and a presentation.

Students are encouraged to explore and identify suitable industries/institutions for the project, and the IIT Patna placement cell would like to guide and facilitate their efforts. The project abstract defining aim, methodology, and deliverable has to be submitted to IIT Patna with due approval of the *project evaluation committee* for further monitoring on the progress of the work.

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SEMESTER V

Code	Course Name	L-T-P-Credits
BO ACS 301	**Computer and Network Security**	3-1-2-5
BO ACS 303	**Operating Systems**	3-1-2-5
BO ACS 305	**Artificial Intelligence Techniques**	3-1-2-5
BO ACS 307	**Industrial and Organizational Psychology**	3-0-0-3
BO ACS 3xx	**Elective I**	3-0-0-3
	Total Credits	21

SEMESTER VI

Code	Course Name	L-T-P-Credits
BO ACS 302	**Big Data Security**	3-1-2-5
BO ACS 304	**Capstone Project II**	0-0-16-8
BO ACS 3xx	**Elective II**	3-0-0-3
BO ACS 3xx	**Elective III**	3-0-0-3
	Total Credits	19

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SEMESTER VII

Code	**Course Name**	**L-T-P-C**
BO ACS 401	Ethics and Technology	3-0-0-3
BO ACS 4xx	Elective - IV	3-0-0-3
BO ACS 4xx	Elective - V	3-0-0-3
BO ACS 403	Project - I	0-0-12-6
BO ACS 405	Indian Knowledge System (IKS)	3-0-0-3
	Total Credits	**18**

SEMESTER VIII

Code	**Course Name**	**L-T-P-C**
BO ACS 4xx	Elective - VI	3-0-0-3
BO ACS 4xx	Elective - VII	3-0-0-3
BO ACS 4xx	Elective - VIII	3-0-0-3
BO ACS 404	Project - II	0-0-16-8
	Total Credits	**17**

Total Minimum Credits =153 + 12* = 165

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ELECTIVE - I

Code	**Course Name**	**L-T-P-C**
BO ACS 309	Cloud Computing	3-0-0-3
BO ACS 311	Cybercrime and Digital Forensics	3-0-0-3

ELECTIVE - II

Code	**Course Name**	**L-T-P-C**
BO ACS 306	Advanced Machine Learning Techniques	3-0-0-3
BO ACS 308	Image and Video Analytics	3-0-0-3
BO ACS 310	Web Application and Penetration Testing	3-0-0-3

ELECTIVE - III

Code	**Course Name**	**L-T-P-C**
BO ACS 312	Introduction to Blockchain and Crptocurrency	3-0-0-3
BO ACS 314	Open Source and Threat Intelligence	3-0-0-3
BO ACS 316	Cyber Security with Blockchain	3-0-0-3
BO ACS 318	IoT Applications and Security	3-0-0-3

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ELECTIVE - IV

Code	**Course Name**	**L-T-P-C**
BO ACS 407	Cryptography	3-0-0-3
BO ACS 409	Time Series Analysis and Forecasting	3-0-0-3
BO ACS 411	Computer Vision	3-0-0-3
BO ACS 413	Blockchain Components and Architecture	3-0-0-3
BO ACS 415	Pattern Recognition	3-0-0-3
BO ACS 417	Principles of Programming Languages	3-0-0-3
BO ACS 419	Social Networks	3-0-0-3
BO ACS 421	Multimedia System	3-0-0-3
BO ACS 423	Nature Inspired Algorithms	3-0-0-3

ELECTIVE – V

Code	**Course Name**	**L-T-P-C**
BO ACS 425	Data Visualization and Communication	3-0-0-3
BO ACS 427	Data Engineering and Pipeline Design	3-0-0-3
BO ACS 429	Reinforcement Learning	3-0-0-3
BO ACS 431	Data Virtualization and Dashboards	3-0-0-3
BO ACS 433	Graph Machine Learning	3-0-0-3
BO ACS 435	Bioinformatics	3-0-0-3
BO ACS 437	Computational Data Analysis	3-0-0-3
BO ACS 439	Blockchain Technology	3-0-0-3
BO ACS 441	Evolutionary Computing	3-0-0-3

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ELECTIVE – VI

Code	**Course Name**	**L-T-P-C**
BO ACS 406	Software Engineering and DevOps Practices	3-0-0-3
BO ACS 408	Information Security Principles	3-0-0-3
BO ACS 410	Game Theory	3-0-0-3
BO ACS 412	Smart Contracts and Solidity Programming	3-0-0-3
BO ACS 414	Multivariate Analysis	3-0-0-3
BO ACS 416	Statistical Machine Learning	3-0-0-3

ELECTIVE – VII

Code	**Course Name**	**L-T-P-C**
BO ACS 418	Generative Artificial Intelligence	3-0-0-3
BO ACS 420	Large Language Model (LLM)	3-0-0-3
BO ACS 422	Mathematical Finance	3-0-0-3
BO ACS 424	Data Mining and Knowledge Discovery	3-0-0-3
BO ACS 426	Quantum Computing	3-0-0-3
BO ACS 428	Drone Data Processing	3-0-0-3
BO ACS 430	Edge Computing	3-0-0-3

ELECTIVE – VIII

Code	**Course Name**	**L-T-P-C**
BO ACS 432	Text Mining	3-0-0-3
BO ACS 434	Big Data Analytics	3-0-0-3
BO ACS 436	Wireless Networks	3-0-0-3