

VASANTRAO NAIK MAHAVIDYALAYA(Autonomous)

Chhatrapati Sambhajnagar | Parent University Dr.BAMU,Chh.Sambhajnagar | NEP 2020 / CCFUP 2024 / NCrF

B.Sc. (Honours) — Artificial Intelligence and Neural Networks

Programme Code: BSc-AINN | 4 Years / 8 Semesters | 166 Credits (Hons) / 166 Credits (Non-Hons) | NCrF

4.5 → 6.0

(a) PROGRAMME SCHEME — Honours & Non-Honours Tracks

Sem	Yr	NCrF	DSC (Core)	Minor (Track)	MDC	AEC	SEC	VAC	INT (IAP C)	DIS S	Sem Total
YEAR 1 NCrF 4.5 Exit after Sem II: Certificate in Artificial Intelligence (40 Credits)											
Sem I	Y1	4.5	8	4	3	2	3	—	—	—	20
Sem II	Y1	4.5	8	4	3	2	3	—	—	—	20
YEAR 2 NCrF 5.0 Exit after Sem IV: Diploma in Artificial Intelligence (80 Credits)											
Sem III	Y2	5.0	12	4	—	2	3	—	—	—	21
Sem IV	Y2	5.0	8	4	6	2	—	2	—	—	22
YEAR 3 NCrF 5.5 Exit after Sem VI: B.Sc. in Artificial Intelligence (120 Credits)											
Sem V	Y3	5.5	16	4	—	—	—	2	2	—	24
Sem VI	Y3	5.5	12	4	—	—	—	4	—	—	20
YEAR 4 NCrF 6.0 HONOURS TRACK Exit after Sem VIII: B.Sc. (Honours) with Research — 166 Credits											
Sem VII	Y4	6.0	10	4	—	—	3	—	2	—	19
Sem VIII (Hons)	Y4	6.0	8	4	—	—	—	—	—	8	20
YEAR 4 NCrF 5.5 NON-HONOURS TRACK Exit after Sem VIII: B.Sc. (without Research) — 166 Credits											
Sem VIII (Non-Hons)	Y4	5.5	8	4	—	—	8 (2 SEC)	—	—	—	20
CCFUP 2024 NORMS			≥80 Cr (≥50%)	≥24 Cr	≥6 Cr	≥8 Cr	≥12 Cr	≥8 Cr	Mandatory each yr	Mandatory (Hons)	166 Cr
HONS TOTAL			84 ✓	32 ✓	12 ✓	8 ✓	12 ✓	8 ✓	4 ✓	8 ✓	166 ✓
NON-HONS TOTAL			84	32	12	8	20 (+8)	8	4	—	166 ✓
3-YEAR EXIT			64 ✓	24 ✓	12 ✓	8 ✓	9 ✓	8 ✓	4 ✓	—	129 ✓

NON-HONOURS TRACK — Sem VIII Substitution

Students who opt out of the research dissertation take two additional SEC courses (4 Cr each = 8 Cr total) in Semester VIII in lieu of RES-801.

SEC-801A: AI Project Management and Entrepreneurship (4 Cr, NSQF 5.5)

SEC-801B: Competitive Programming and Open Source AI (4 Cr, NSQF 5.5)

Award: B.Sc. in Artificial Intelligence and Neural Networks (without Honours) — 166 Credits — NCrF 5.5

(b) CCFUP 2024 CATEGORY COMPLIANCE SUMMARY — Honours & Non-Honours (R1905-v2)

Category	Credits (v2)	CCFUP 2024 Norm	Status
DSC (Major Core)	84 Cr	≥80 Cr (≥50% of 166)	COMPLIANT ✓
Minor (Track)	32 Cr	≥24 Cr	COMPLIANT ✓
MDC	12 Cr	≥6 Cr	COMPLIANT ✓ (was 9 Cr in R1905 — to 12 Cr: MDC-101+MDC-201+MDC-401+MDC-402)
AEC	8 Cr	≥8 Cr	COMPLIANT ✓
SEC (Hons track)	12 Cr	≥12 Cr	COMPLIANT ✓ (SEC-101 + SEC-201 + SEC-301 + SEC-701)
SEC (Non-Hons track)	20 Cr	≥12 Cr	COMPLIANT ✓ (adds SEC-801A + SEC-801B: 8 Cr)
VAC	8 Cr	≥8 Cr	COMPLIANT ✓
INT (IAPC)	4 Cr	Mandatory each year	COMPLIANT ✓ (INT-501 Sem V + INT-701 Sem VII; was 2 Cr in R1905 — INT-501 restored)
DISS (Hons)	8 Cr	Honours: mandatory	COMPLIANT ✓ (RES-801, Sem VIII)
DISS (Non-Hons)	— Cr	Not required	WAIVED ✓ (replaced by SEC-801A + SEC-801B)
HONS TOTAL	166 Cr	160 Cr min (CCFUP)	VALID ✓ (was 165 Cr in R1905 — recalculated to 166 Cr)
NON-HONS TOTAL	166 Cr	160 Cr min (CCFUP)	VALID ✓ (was 165 Cr in R1905 — recalculated to 166 Cr)

(c) SEMESTER-WISE COURSE DETAILS — Code · Title · Category · L-T-P · Credits · NSQF

Semester I · Year 1 · NCrF 4.5 · Total: 20 Credits Exit: Certificate in Artificial Intelligence (40 Cr)					
Code	Course Title	Category	L-T-P	Credits	NSQF
AINN-101	Foundational Programming – I (Python)	DSC	3-0-2	4	4.5
AINN-102	Mathematics for Computing – I (Calculus & Linear Algebra)	DSC	3-0-2	4	4.5
MIN-101	Minor Stream Course I (HB / FT / AS)	Minor	3-1-0	4	4.5
MDC-101	Principles of Economics	MDC	3-0-0	3	4.5
AEC-101	Communicative English	AEC	2-0-0	2	4.5
SEC-101	Digital Fluency and Information Literacy	SEC	2-0-2	3	4.5
SEMESTER TOTAL				20	

Semester II · Year 1 · NCrF 4.5 · Total: 20 Credits					
Code	Course Title	Category	L-T-P	Credits	NSQF
AINN-201	Foundational Programming – II (Data Structures & OOP)	DSC	3-0-2	4	4.5
AINN-202	Applied Statistics and Probability for AI ↑ from Sem III	DSC	3-0-2	4	4.5
MIN-201	Minor Stream Course II (HB / FT / AS)	Minor	3-1-0	4	4.5
MDC-201	Introduction to Psychology and Cognitive Processes	MDC	3-0-0	3	4.5
AEC-201	Modern Indian Language (Marathi / Hindi)	AEC	2-0-0	2	4.5
SEC-201	Data Visualisation Tools and Techniques	SEC	2-0-2	3	4.5
SEMESTER TOTAL				20	

Semester III · Year 2 · NCrF 5.0 · Total: 21 Credits CORRECTED from 20					
Code	Course Title	Category	L-T-P	Credits	NSQF
AINN-301	Mathematics for Computing – II (Optimisation & Discrete Math)	DSC	3-1-0	4	5.0
AINN-302	Foundations of AI and Logical Reasoning	DSC	3-1-0	4	5.0
AINN-303	Database Management Systems for AI ↑ from Sem IV	DSC	3-0-2	4	5.0
MIN-301	Minor Stream Course III (HB / FT / AS)	Minor	3-1-0	4	5.0
AEC-301	Advanced Professional Communication	AEC	2-0-0	2	5.0
SEC-301	Technical Writing and Communication for AI	SEC	2-0-2	3	5.0
SEMESTER TOTAL				21	

Semester IV · Year 2 · NCrF 5.0 · Total: 22 Credits | Exit: Diploma in Artificial Intelligence (80 Cr)

Code	Course Title	Category	L-T-P	Credits	NSQ F
AINN-401	Statistical Learning and Machine Learning Methods	DSC	3-1-0	4	5.0
AINN-402	Neural Networks and Deep Learning Systems	DSC	3-0-2	4	5.0
MIN-401	Minor Stream Course IV (HB / FT / AS)	Minor	3-1-0	4	5.0
MDC-401	Digital Humanities and Technology re-coded from MDC-301 CORRECTED	MDC	3-0-0	3	5.0
AEC-401	Foreign Language – German / Japanese	AEC	2-0-0	2	5.0
VAC-401	Environmental Science and Sustainability	VAC	2-0-0	2	5.0
MDC-402	Cognitive Science and Human Intelligence Models re-coded from MDC-401 CORRECTED	MDC	3-0-0	3	5.0
SEMESTER TOTAL				22	

Semester V · Year 3 · NCrF 5.5 · Total: 22 Credits | INT-501 restored; RES-504 reduced 4→2 Cr

Code	Course Title	Category	L-T-P	Credits	NSQ F
AINN-501	Natural Language Processing and Text Analytics	DSC	3-0-2	4	5.5
AINN-502	Computer Vision and Image Understanding	DSC	3-0-2	4	5.5
AINN-503	Reinforcement Learning and Sequential Decision Making	DSC	3-0-2	4	5.5
RES-504	Research Methodology and Scientific Writing reduced 4→2 Cr CORRECTED	DSC	2-1-0	2	5.5
MIN-501	Minor Stream Course V (HB / FT / AS)	Minor	3-1-0	4	5.5
VAC-501	Universal Human Values and Professional Ethics	VAC	2-0-0	2	5.5
INT-501	Research / Industry Internship I RESTORED	INT	—	2	5.5
SEMESTER TOTAL				22	

Semester VI · Year 3 · NCrF 5.5 · Total: 20 Credits | Exit: B.Sc. in AI (120 Cr)

Code	Course Title	Category	L-T-P	Credits	NSQ F
AINN-601	Robotics and Intelligent Autonomous Systems	DSC	3-0-2	4	5.5
AINN-602	Knowledge Representation and Expert Systems	DSC	3-0-2	4	5.5
AINN-603	MLOps and Cloud Deployment	DSC	3-0-2	4	5.5
MIN-601	Minor Stream Course VI (HB / FT / AS)	Minor	3-1-0	4	5.5
VAC-601	Cyber Security and Defensive Technologies	VAC	2-0-0	2	5.5
VAC-602	Indian Knowledge Systems: Ancient Logic and Computation	VAC	2-0-0	2	5.5

SEMESTER TOTAL 20**Semester VII · Year 4 · NCrF 6.0 · Total: 19 Credits AINN-703 corrected to 2 Cr**

Code	Course Title	Category	L-T-P	Credits	NSQ F
AINN-701	Generative AI and Foundation Models	DSC	3-0-2	4	6.0
AINN-702	Neural Network Modelling, Simulation and AI Tools	DSC	3-0-2	4	6.0
AINN-703	Core Elective – I (pre-approved pool) reduced 4→2 Cr post INT-701 split CORRECTED	DSC	2-0-0	2	6.0
SEC-701	AI Tools for Industry and Open Source Contribution	SEC	2-0-1	3	6.0
MIN-701	Minor Stream Course VII (HB / FT / AS)	Minor	3-1-0	4	6.0
INT-701	Research / Industry Internship II	INT	—	2	6.0
SEMESTER TOTAL				19	

Semester VIII — HONOURS TRACK · Year 4 · NCrF 6.0 · Total: 20 Credits | Exit: B.Sc. (Hons) 166 Cr

Code	Course Title	Category	L-T-P	Credits	NSQ F
AINN-801	Advanced Prompt Engineering and Human-AI Interaction	DSC	3-0-2	4	6.0
AINN-802	Ethics, Trust and Responsible AI	DSC	3-0-2	4	6.0
MIN-801	Minor Stream Course VIII (HB / FT / AS)	Minor	3-1-0	4	6.0
RES-801	Dissertation / Honours Research Project	DISS	0-0-16	8	6.0
SEMESTER TOTAL				20	

Semester VIII — NON-HONOURS TRACK · Year 4 · NCrF 5.5 · Total: 20 Credits | Exit: B.Sc. AINN 166 Cr

Code	Course Title	Category	L-T-P	Credits	NSQ F
AINN-801	Advanced Prompt Engineering and Human-AI Interaction	DSC	3-0-2	4	5.5
AINN-802	Ethics, Trust and Responsible AI	DSC	3-0-2	4	5.5
MIN-801	Minor Stream Course VIII (HB / FT / AS)	Minor	3-1-0	4	5.5
SEC-801A	AI Project Management and Entrepreneurship replaces Dissertation NEW	SEC	3-0-2	4	5.5
SEC-801B	Competitive Programming and Open Source AI replaces Dissertation	SEC	2-0-2	4	5.5
SEMESTER TOTAL				20	

(d) MINOR STREAM COURSE LISTINGS — All Three Tracks (HB / FT / AS)

MINOR TRACK — HB: Health Informatics and Biomedical AI				
Code	Course Title	L-T-P	Cr	NSQ F
MIN-HB-101	Foundations of Health Informatics	3-1-0	4	4.5
MIN-HB-201	Medical Image Analysis using Deep Learning	3-0-2	4	4.5
MIN-HB-301	Clinical Data Analytics	3-1-0	4	5.0
MIN-HB-401	AI in Drug Discovery and Genomics	3-0-2	4	5.0
MIN-HB-501	Predictive Modelling for Patient Care	3-0-2	4	5.5
MIN-HB-601	Wearable Sensors and IoT Healthcare Systems	3-0-2	4	5.5
MIN-HB-701	NLP for Medical Literature and Clinical Text	3-0-2	4	6.0
MIN-HB-801	Ethics, Legal and Privacy Issues in Health AI	3-1-0	4	6.0

MINOR TRACK — FT: FinTech and Quantitative Finance				
Code	Course Title	L-T-P	Cr	NSQ F
MIN-FT-101	Foundations of Financial Markets and Instruments	3-1-0	4	4.5
MIN-FT-201	Financial Time Series and Quantitative Analysis	3-1-0	4	4.5
MIN-FT-301	Blockchain Architectures and Smart Contracts	3-0-2	4	5.0
MIN-FT-401	Machine Learning for Fraud Detection and Risk	3-0-2	4	5.0
MIN-FT-501	Algorithmic Trading and High-Frequency Systems	3-0-2	4	5.5
MIN-FT-601	Portfolio Optimisation using Reinforcement Learning	3-0-2	4	5.5
MIN-FT-701	Sentiment Analysis of Financial News and Social Media	3-0-2	4	6.0
MIN-FT-801	AI in Banking, Credit Scoring and InsurTech	3-0-2	4	6.0

MINOR TRACK — AS: Autonomous Systems and Robotics				
Code	Course Title	L-T-P	Cr	NSQ F
MIN-AS-101	Foundations of Robotics and Kinematics	3-1-0	4	4.5
MIN-AS-201	Sensors, Actuators and Signal Processing	3-0-2	4	4.5
MIN-AS-301	Computer Vision for Autonomous Navigation	3-0-2	4	5.0
MIN-AS-401	Robot Operating System (ROS2) and Simulation	3-0-2	4	5.0
MIN-AS-501	Deep Reinforcement Learning for Robotic Control	3-0-2	4	5.5
MIN-AS-601	Path Planning, Localisation and SLAM	3-0-2	4	5.5
MIN-AS-701	Swarm Robotics and Multi-Agent Systems	3-0-2	4	6.0
MIN-AS-801	Human-Robot Interaction and Cognitive Robotics	3-0-2	4	6.0