

NTHRYS

OPC PVT LTD

CATALOGUE 04 • NBPH

Phylogenetics & Molecular Evolution

A complete industrial catalogue of hands-on training modules in phylogenetic inference and molecular evolution — from distance and parsimony methods to maximum likelihood, Bayesian inference, support testing, phylogenomics, selection analysis, applied outbreak phylogenetics and publication figure preparation. Every module is issued against its own controlled protocol, contact-hour allocation and published fee.

59 PROTOCOL-BACKED MODULES • 10 CATEGORY STREAMS

1644 CONTACT HOURS • 2026 EDITION

59

MODULES

10

STREAMS

1644

HOURS

59

PROTOCOLS

Program Categories at a Glance

This catalogue lists every phylogenetic and molecular-evolution method our training programs are equipped to operate and teach, organised into 10 technology streams. Each module carries a unique product code, a controlled protocol document, an individually assessed contact-hour allocation and its own published fee. No two protocols are priced alike — duration and fee follow the statistical depth, compute load and assessment weight of that specific module.

STREAM	CATEGORY	FOCUS DESCRIPTION	MODULES	HOURS	DAYS	BUNDLE (INR)
NBPH-FD	Phylogenetic Foundations & Tree Thinking	Trees, rooting, data matrices & error sources	6	132	24	39,700
NBPH-DM	Distance-Based Methods	Distance correction, NJ & minimum evolution	6	142	26	42,700
NBPH-MP	Parsimony & Character-Based Methods	Optimality, tree search, homoplasy & consensus	5	130	23	39,300
NBPH-ML	Maximum Likelihood Inference	Likelihood, substitution models & tree search	6	178	32	54,900
NBPH-BY	Bayesian Phylogenetics	MCMC, priors, convergence & posterior summaries	6	180	32	55,800
NBPH-SP	Support, Testing & Conflict Assessment	Bootstrap, topology tests & concordance	6	154	28	47,600
NBPH-GN	Phylogenomics & Large Datasets	Orthogroups, supermatrices & coalescent methods	6	194	34	61,100
NBPH-MO	Molecular Evolution & Selection Analysis	Clocks, dating, dN/dS & ancestral reconstruction	6	196	35	61,600
NBPH-EP	Applied Phylogenetics: Epidemiology & Ecology	Phylodynamics, lineages, phylogeography & placement	6	184	32	57,500
NBPH-VZ	Visualisation, Annotation & Reproducibility	Tree graphics, metadata display & archiving	6	154	28	47,600
Complete NBPH catalogue			59	1644	294	388,400

HOW TO READ A MODULE CODE

NBPH – FD – 01

NBPH

Nthrys Bioinformatics catalogue — Phylogenetics & Molecular Evolution

FD

Category stream code

01

Module number within the stream

HOW TO READ A PROTOCOL REFERENCE

PRT/NBPH/FD/01

PRT

Controlled protocol held in the training SOP register

NBPH/FD/01

Maps one-to-one to the module code alongside

Bundle figures are the discounted price for enrolling in every module of that stream together. Individual module hours and fees are printed on each category page. All fees exclude applicable GST.

Every Module Is a Controlled Protocol

There is no flat course fee in this catalogue. Each module is written up as its own protocol document, timed against the work it actually contains, and priced on that basis — contact hours, algorithmic and compute load, number of tools operated and the depth of the assessment task.

CONTENTS OF EVERY PRT DOCUMENT

01

Scope & competency statement

What the trainee will be able to do on completion, mapped to the module code.

02

Resource inventory

Tools, versions, reference databases and datasets recorded before start.

03

Stepwise procedure

Numbered operations with decision points, parameters and expected intermediates.

04

Worked reference exercise

A supplied query and subject set with the correct output for self-verification.

05

Acceptance criteria

The result a trainee must reproduce for the protocol to be signed as complete.

06

Failure modes & troubleshooting

Known error states, misleading hits and how each is resolved.

07

Assessment task & marking

The independent task, its weighting and the pass threshold.

08

Completion record

Trainer sign-off, date, hours logged and certificate serial entry.

MODULE DURATION RANGE

16 – 40 hours

Allocated per protocol, not per tier. A scoring-concepts module runs 16 hours; profile-profile remote homology detection runs 40.

MODULE FEE RANGE

INR 5,600 – 14,800

Set individually against each protocol. Iterative profile search, genome-scale alignment and pipeline construction carry the highest compute and supervision load.

1644

TOTAL HOURS

294

TOTAL DAYS

59

PROTOCOLS

ENROLMENT OPTION	SCOPE	HOURS	FEE (INR)	SAVING
Single Module	Any one module code, priced as printed on its category page	16 – 40	5,600 – 14,800	—
Stream Bundle	Every module within one category stream	130 – 196	39,300 – 61,600	15%
Core Inference Track	Streams FD, DM, MP, ML, BY — 29 modules	762	213,300	22%
Professional Track	Streams FD through MO — 47 modules	1306	341,100	28%
Complete NBPH Catalogue	All 10 streams — 59 modules, 59 protocols	1644	388,400	35%

WHAT THE MODULE FEE INCLUDES

— Workstation access — dedicated Linux workstation for the logged hours of the module

— Issued protocol — the controlled PRT document, retained by the candidate

— Reference datasets — query sets, subject databases and verified reference outputs

— Certification — serially numbered certificate quoting module code, protocol reference and hours

— Post-training support — 60 days of query support by email

ENROLMENT & PAYMENT TERMS

— Registration — INR 1,000 per candidate, adjusted against the module fee

— Taxes — GST applicable at prevailing rates over and above listed fees

— Live-online mode — 80% of the listed on-campus fee for eligible modules

— Concessions — 10% for groups of three or more; 15% against a valid institutional identity card

— Scheduling — rolling monthly intakes; custom dates for institutional groups

— Validity — fees quoted for the 2026 edition, confirmed at the time of enrolment

01

CATEGORY • NBPH-FD

Phylogenetic Foundations & Tree Thinking

Trees, rooting, data matrices & error sources

6

MODULES

CODE	TRAINING MODULE	PROTOCOL REF	DURATION		FEE (INR)
NBPH-FD-01	Homology, Gene Trees & Species Trees What a tree represents and what it cannot.	PRT/NBPH/FD/01	18 HOURS	03 DAYS	6,300
NBPH-FD-02	Tree Terminology, Topology & Rooting Clades, polytomies, outgroups & rooting strategy.	PRT/NBPH/FD/02	16 HOURS	03 DAYS	5,600
NBPH-FD-03	Tree File Formats & Their Interpretation Newick, NEXUS & PhyloXML structure and pitfalls.	PRT/NBPH/FD/03	20 HOURS	04 DAYS	7,000
NBPH-FD-04	Character Coding & Data Matrix Construction Character types, states, missing data & matrices.	PRT/NBPH/FD/04	24 HOURS	04 DAYS	8,500
NBPH-FD-05	Sources of Phylogenetic Error Long-branch attraction, saturation & sampling bias.	PRT/NBPH/FD/05	26 HOURS	05 DAYS	9,300
NBPH-FD-06	Tree Comparison & Distance Metrics Robinson-Foulds, quartet distance & tanglegrams.	PRT/NBPH/FD/06	28 HOURS	05 DAYS	10,000

STREAM BUNDLE • 6 MODULES • 6 PROTOCOLS • 132 HOURS • 24 DAYS

~~46,700~~ 39,700 INR

Each module is enrolled and certified independently against its own protocol reference, or taken together as the discounted stream bundle. Duration is the logged contact-hour allocation for that protocol; days are computed at six contact hours per working day. Fees exclude applicable GST.

02

CATEGORY • NBPH-DM

Distance-Based Methods

Distance correction, NJ & minimum evolution

6

MODULES

CODE	TRAINING MODULE	PROTOCOL REF	DURATION		FEE (INR)
NBPH-DM-01	Genetic Distance Measures & Model Correction Observed versus corrected distance & saturation.	PRT/NBPH/DM/01	22 HOURS	04 DAYS	7,700
NBPH-DM-02	JC, K2P, TN93 & Distance Model Selection Model assumptions & matched parameter estimation.	PRT/NBPH/DM/02	24 HOURS	04 DAYS	8,500
NBPH-DM-03	UPGMA & Clock-Based Clustering Ultrametric assumptions & where they break.	PRT/NBPH/DM/03	20 HOURS	04 DAYS	7,000
NBPH-DM-04	Neighbour-Joining & BIONJ Agglomeration, branch lengths & unrooted output.	PRT/NBPH/DM/04	28 HOURS	05 DAYS	9,900
NBPH-DM-05	Minimum Evolution & Fast Distance Methods Balanced minimum evolution & large-tree speed.	PRT/NBPH/DM/05	26 HOURS	05 DAYS	9,300
NBPH-DM-06	Evaluating & Reporting Distance Trees Support, comparison & honest reporting limits.	PRT/NBPH/DM/06	22 HOURS	04 DAYS	7,800

STREAM BUNDLE • 6 MODULES • 6 PROTOCOLS • 142 HOURS • 26 DAYS

~~50,200~~ 42,700 INR

Each module is enrolled and certified independently against its own protocol reference, or taken together as the discounted stream bundle. Duration is the logged contact-hour allocation for that protocol; days are computed at six contact hours per working day. Fees exclude applicable GST.

03

CATEGORY • NBPH-MP

Parsimony & Character-Based Methods

Optimality, tree search, homoplasy & consensus

5

MODULES

CODE	TRAINING MODULE	PROTOCOL REF	DURATION		FEE (INR)
NBPH-MP-01	Parsimony Principles & Character Optimisation Fitch and Sankoff scoring on a fixed topology.	PRT/NBPH/MP/01	26 HOURS	05 DAYS	9,200
NBPH-MP-02	Tree Search: Exhaustive, Branch-and-Bound & Heuristic NNI, SPR, TBR & search-space strategy.	PRT/NBPH/MP/02	30 HOURS	05 DAYS	10,700
NBPH-MP-03	Homoplasy, Consistency & Retention Indices Measuring character fit & interpreting conflict.	PRT/NBPH/MP/03	22 HOURS	04 DAYS	7,800
NBPH-MP-04	Consensus Trees & Their Construction Strict, majority-rule & semi-strict consensus.	PRT/NBPH/MP/04	24 HOURS	04 DAYS	8,500
NBPH-MP-05	Parsimony Analysis in Practice Full analysis run, settings & documented output.	PRT/NBPH/MP/05	28 HOURS	05 DAYS	10,000

STREAM BUNDLE • 5 MODULES • 5 PROTOCOLS • 130 HOURS • 23 DAYS

~~46,200~~ 39,300 INR

Each module is enrolled and certified independently against its own protocol reference, or taken together as the discounted stream bundle. Duration is the logged contact-hour allocation for that protocol; days are computed at six contact hours per working day. Fees exclude applicable GST.

04

CATEGORY • NBPH-ML

Maximum Likelihood Inference

Likelihood, substitution models & tree search

6

MODULES

CODE	TRAINING MODULE	PROTOCOL REF	DURATION		FEE (INR)
NBPH-ML-01	Likelihood Framework & the Pruning Algorithm Site likelihoods, conditional probabilities & scaling.	PRT/NBPH/ML/01	32 HOURS	06 DAYS	11,600
NBPH-ML-02	Nucleotide Substitution Models JC to GTR, parameterisation & base frequencies.	PRT/NBPH/ML/02	28 HOURS	05 DAYS	10,000
NBPH-ML-03	Rate Heterogeneity & Site Models Gamma categories, invariant sites & free-rate models.	PRT/NBPH/ML/03	26 HOURS	05 DAYS	9,400
NBPH-ML-04	Amino-Acid & Codon Substitution Models Empirical matrices, mixture & codon models.	PRT/NBPH/ML/04	30 HOURS	05 DAYS	10,900
NBPH-ML-05	Model Selection by Information Criteria AIC, BIC & automated model finders.	PRT/NBPH/ML/05	24 HOURS	04 DAYS	8,700
NBPH-ML-06	ML Tree Search & Optimisation in Practice Search settings, checkpoints & result validation.	PRT/NBPH/ML/06	38 HOURS	07 DAYS	14,000

STREAM BUNDLE • 6 MODULES • 6 PROTOCOLS • 178 HOURS • 32 DAYS

~~64,600~~ 54,900 INR

Each module is enrolled and certified independently against its own protocol reference, or taken together as the discounted stream bundle. Duration is the logged contact-hour allocation for that protocol; days are computed at six contact hours per working day. Fees exclude applicable GST.

05

CATEGORY • NBPH-BY

Bayesian Phylogenetics

MCMC, priors, convergence & posterior summaries

6

MODULES

CODE	TRAINING MODULE	PROTOCOL REF	DURATION		FEE (INR)
NBPH-BY-01	Bayesian Inference & Posterior Probabilities Priors, likelihood & interpreting posterior support.	PRT/NBPH/BY/01	28 HOURS	05 DAYS	10,100
NBPH-BY-02	MCMC Mechanics, Priors & Proposals Chains, heating, proposal tuning & mixing.	PRT/NBPH/BY/02	32 HOURS	06 DAYS	11,700
NBPH-BY-03	MrBayes Configuration & Execution Block construction, partitions & run management.	PRT/NBPH/BY/03	30 HOURS	05 DAYS	10,900
NBPH-BY-04	BEAST-Class Analysis Setup XML construction, tree priors & calibration input.	PRT/NBPH/BY/04	40 HOURS	07 DAYS	14,800
NBPH-BY-05	Convergence Diagnostics & Run Assessment ESS, traces, split frequencies & run combination.	PRT/NBPH/BY/05	26 HOURS	05 DAYS	9,500
NBPH-BY-06	Summarising Posteriors & MCC Trees Credible sets, annotation & height reporting.	PRT/NBPH/BY/06	24 HOURS	04 DAYS	8,700

STREAM BUNDLE • 6 MODULES • 6 PROTOCOLS • 180 HOURS • 32 DAYS

~~65,700~~ 55,800 INR

Each module is enrolled and certified independently against its own protocol reference, or taken together as the discounted stream bundle. Duration is the logged contact-hour allocation for that protocol; days are computed at six contact hours per working day. Fees exclude applicable GST.

06

CATEGORY • NBPH-SP

Support, Testing & Conflict Assessment

Bootstrap, topology tests & concordance

6

MODULES

CODE	TRAINING MODULE	PROTOCOL REF	DURATION		FEE (INR)
NBPH-SP-01	Bootstrap Methods & Interpretation Standard, rapid & transfer bootstrap in practice.	PRT/NBPH/SP/01	26 HOURS	05 DAYS	9,400
NBPH-SP-02	Jackknife & Resampling Alternatives Resampling schemes & comparative behaviour.	PRT/NBPH/SP/02	20 HOURS	04 DAYS	7,100
NBPH-SP-03	Approximate Likelihood-Ratio Tests SH-aLRT support & combined support reporting.	PRT/NBPH/SP/03	24 HOURS	04 DAYS	8,700
NBPH-SP-04	Topology Tests: KH, SH & AU Constrained trees, test setup & interpretation.	PRT/NBPH/SP/04	30 HOURS	05 DAYS	11,000
NBPH-SP-05	Gene & Site Concordance Factors Quantifying agreement beyond bootstrap values.	PRT/NBPH/SP/05	28 HOURS	05 DAYS	10,300
NBPH-SP-06	Detecting & Reporting Conflicting Signal Networks, splits & transparent conflict reporting.	PRT/NBPH/SP/06	26 HOURS	05 DAYS	9,500

STREAM BUNDLE • 6 MODULES • 6 PROTOCOLS • 154 HOURS • 28 DAYS

~~56,000~~ 47,600 INR

Each module is enrolled and certified independently against its own protocol reference, or taken together as the discounted stream bundle. Duration is the logged contact-hour allocation for that protocol; days are computed at six contact hours per working day. Fees exclude applicable GST.

07

CATEGORY • NBPH-GN

Phylogenomics & Large Datasets

Orthogroups, supermatrices & coalescent methods

6

MODULES

CODE	TRAINING MODULE	PROTOCOL REF	DURATION		FEE (INR)
NBPH-GN-01	Orthogroup Inference & Marker Selection Ortholog sets, paralogy filtering & marker choice.	PRT/NBPH/GN/01	34 HOURS	06 DAYS	12,600
NBPH-GN-02	Supermatrix & Supertree Strategy Concatenation versus summary approaches.	PRT/NBPH/GN/02	30 HOURS	05 DAYS	11,100
NBPH-GN-03	Coalescent Species-Tree Estimation Summary coalescent methods & input gene trees.	PRT/NBPH/GN/03	36 HOURS	06 DAYS	13,300
NBPH-GN-04	Gene-Tree / Species-Tree Discordance & ILS Sources of discordance & quantifying them.	PRT/NBPH/GN/04	32 HOURS	06 DAYS	11,900
NBPH-GN-05	Partitioning Schemes & Model Merging Partition definition, merging & model assignment.	PRT/NBPH/GN/05	28 HOURS	05 DAYS	10,300
NBPH-GN-06	Compute Strategy for Phylogenomic Datasets Parallelism, checkpointing & resource planning.	PRT/NBPH/GN/06	34 HOURS	06 DAYS	12,700

STREAM BUNDLE • 6 MODULES • 6 PROTOCOLS • 194 HOURS • 34 DAYS

~~74,900~~ 61,100 INR

Each module is enrolled and certified independently against its own protocol reference, or taken together as the discounted stream bundle. Duration is the logged contact-hour allocation for that protocol; days are computed at six contact hours per working day. Fees exclude applicable GST.

08

CATEGORY • NBPH-MO

Molecular Evolution & Selection Analysis

Clocks, dating, dN/dS & ancestral reconstruction

6

MODULES

CODE	TRAINING MODULE	PROTOCOL REF	DURATION		FEE (INR)
NBPH-MO-01	Molecular Clock Concepts & Tests Rate constancy, clock tests & assumptions.	PRT/NBPH/MO/01	26 HOURS	05 DAYS	9,400
NBPH-MO-02	Divergence-Time Estimation & Calibration Fossil and tip calibration, priors & reporting.	PRT/NBPH/MO/02	38 HOURS	07 DAYS	14,100
NBPH-MO-03	dN/dS Estimation & Site Models Codon models, site classes & likelihood ratio tests.	PRT/NBPH/MO/03	34 HOURS	06 DAYS	12,600
NBPH-MO-04	Branch & Branch-Site Selection Models Foreground branches, null models & correction.	PRT/NBPH/MO/04	36 HOURS	06 DAYS	13,400
NBPH-MO-05	Relaxed Clocks & Lineage Rate Variation Uncorrelated and local clock models in practice.	PRT/NBPH/MO/05	30 HOURS	05 DAYS	11,100
NBPH-MO-06	Ancestral Sequence Reconstruction Marginal and joint reconstruction & uncertainty.	PRT/NBPH/MO/06	32 HOURS	06 DAYS	11,900

STREAM BUNDLE • 6 MODULES • 6 PROTOCOLS • 196 HOURS • 35 DAYS

~~72,500~~ 61,600 INR

Each module is enrolled and certified independently against its own protocol reference, or taken together as the discounted stream bundle. Duration is the logged contact-hour allocation for that protocol; days are computed at six contact hours per working day. Fees exclude applicable GST.

09

CATEGORY • NBPH-EP

Applied Phylogenetics: Epidemiology & Ecology

Phylogenetics, lineages, phylogeography & placement

6

MODULES

CODE	TRAINING MODULE	PROTOCOL REF	DURATION		FEE (INR)
NBPH-EP-01	Phylogenetics & Transmission Inference Population dynamics from sampled genomes.	PRT/NBPH/EP/01	36 HOURS	06 DAYS	13,300
NBPH-EP-02	Lineage Assignment & Nomenclature Systems Clade definition, assignment tools & versioning.	PRT/NBPH/EP/02	24 HOURS	04 DAYS	8,800
NBPH-EP-03	Recombination Detection & Tree Distortion Breakpoint detection & partitioned inference.	PRT/NBPH/EP/03	30 HOURS	05 DAYS	11,000
NBPH-EP-04	Phylogeography & Trait Diffusion Models Discrete and continuous trait models on trees.	PRT/NBPH/EP/04	34 HOURS	06 DAYS	12,600
NBPH-EP-05	Barcoding, Delimitation & Species Assignment Marker-based identification & delimitation tests.	PRT/NBPH/EP/05	28 HOURS	05 DAYS	10,200
NBPH-EP-06	Phylogenetic Placement of Environmental Reads Reference-tree placement & taxonomic assignment.	PRT/NBPH/EP/06	32 HOURS	06 DAYS	11,800

STREAM BUNDLE • 6 MODULES • 6 PROTOCOLS • 184 HOURS • 32 DAYS

~~67,700~~ 57,500 INR

Each module is enrolled and certified independently against its own protocol reference, or taken together as the discounted stream bundle. Duration is the logged contact-hour allocation for that protocol; days are computed at six contact hours per working day. Fees exclude applicable GST.

10

CATEGORY • NBPH-VZ

Visualisation, Annotation & Reproducibility

Tree graphics, metadata display & archiving

6

MODULES

CODE	TRAINING MODULE	PROTOCOL REF	DURATION		FEE (INR)
NBPH-VZ-01	Tree Visualisation Software Operation Interactive viewers, layouts & rooting controls.	PRT/NBPH/VZ/01	20 HOURS	04 DAYS	7,100
NBPH-VZ-02	Programmatic Tree Graphics in R Layered tree plots, scaling & faceted figures.	PRT/NBPH/VZ/02	30 HOURS	05 DAYS	11,000
NBPH-VZ-03	Tree Scripting with ETE & Biopython Phylo Traversal, manipulation & batch rendering.	PRT/NBPH/VZ/03	32 HOURS	06 DAYS	11,700
NBPH-VZ-04	Annotating Trees with Metadata & Matrices Trait strips, heatmaps & aligned data panels.	PRT/NBPH/VZ/04	26 HOURS	05 DAYS	9,500
NBPH-VZ-05	Publication Figure Preparation & Export Vector export, typography & journal requirements.	PRT/NBPH/VZ/05	22 HOURS	04 DAYS	8,000
NBPH-VZ-06	Reproducible Workflows & Tree Archiving Parameter capture, deposition & re-runnable runs.	PRT/NBPH/VZ/06	24 HOURS	04 DAYS	8,700

STREAM BUNDLE • 6 MODULES • 6 PROTOCOLS • 154 HOURS • 28 DAYS

~~56,000~~ 47,600 INR

Each module is enrolled and certified independently against its own protocol reference, or taken together as the discounted stream bundle. Duration is the logged contact-hour allocation for that protocol; days are computed at six contact hours per working day. Fees exclude applicable GST.

Build a Career in Evolutionary Analysis

Every module in this catalogue is delivered as hands-on training on live sequence datasets and working inference installations, against a controlled protocol issued at the start and signed off at the end — covering tree thinking and data matrix construction, distance and parsimony methods, maximum likelihood and Bayesian inference, branch support and topology testing, phylogenomic and coalescent species-tree estimation, molecular clocks, divergence dating and selection analysis, applied outbreak and phylogeographic work, and the visualisation and archiving standards that make a phylogeny publishable. Mix and match modules to design a track that fits your goals.

59TRAINING
MODULES

59CONTROLLED
PROTOCOLS

10CATEGORY
STREAMS

1644CONTACT
HOURS

04OF THE NTHRYS
BIOINFORMATICS SERIES**NTHRYS OPC PVT LTD**

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CATALOGUE

NBPH • 2026 Edition