



World Bank – ICAR Funded
National Agricultural Higher Education Project (NAHEP)
Centre for Advanced Agricultural Science and Technology (CAAST)
Training on “Genomics Assisted Breeding for Crop Improvement”

(30th September - 12th October 2019)

Division of Genetics, ICAR-IARI, New Delhi

Course Directors: Dr. A. K. Singh, JD(R) & Head, Genetics

Dr. Vinod, Professor, Genetics

Course Coordinators: Dr. Gopala Krishnan S, Principal Scientist, Genetics

Dr. Ranjith K. Ellur, Scientist, Genetics

Dr. Kumar Durgesh, Scientist (Sr. Scale), Genetics

PROGRAMME SCHEDULE

Day/ Time	Topic	Resource Person
Day 1	30-09-2019 (Monday)	
9.30-10.00	Registration	
10.00-11.00	Inaugural Function	
10:00- 10:05	Welcome Address	Ashok Kumar Singh, Course Director and JD(R)
10:05 – 10:20	An overview of NAHEP-CAAST & Introduction of trainees	C Viswanathan, PI & Head, Plant Physiology
10:20 – 10:30	Address by Director, ICAR-IARI	AK Singh, Director, ICAR-IARI & DDG
10:30 – 10:50	Address by Chief Guest	Prof. Ram Badhan Singh, Chancellor, CAU, Imphal
10:50 – 10:55	Vote of thanks	Vinod, Professor, Genetics
10:55 - 11:00	Group Photo	
11:00 - 11.10	High Tea	
11:10 - 11:30	Pre-training evaluation	Gopala Krishnan S & RK Ellur
11:30 - 12:30	Lecture 1: Rice molecular breeding	AK Singh, ICAR-IARI
12:30 – 13:30	Lecture 2: Fundamentals of gene/ QTL mapping	A Talukdar, ICAR-IARI
13:30 – 14:15	Lunch break	
14:15 – 15:15	Practical 1: Visit to genome sequencing facility	K Gaikwad, ICAR-NIPB
15:15 – 16:15	Tea break	
16:15 – 17:15	Practical 2: Visit to genotyping facility	ACR Mithra, ICAR-NIPB



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Day 2	01-10-2018 (Tuesday)	
9:30 – 10:30	Lecture 3: Genome sequencing and its application in crops	NK Singh, ICAR-NIPB
10:30 - 11.30	Lecture 4: QTL mapping approaches in crops	KK Vinod, ICAR-IARI
11:30 – 12:00	Tea break	
12:30 – 13:30	Lecture 5: Phenomics, the next generation phenotyping for trait dissection and crop improvement	C Viswanathan, ICAR-IARI
13:30 - 14:15	Lunch break	
14:15 – 15:15	Practical 3: Data curation and handling of genotypic data	KK Vinod, ICAR-IARI
15:15 – 15:45	Tea break	
15:45 – 17:15	Practical 4: Softwares for data analysis - Linkage mapping	KK Vinod, ICAR-IARI
Day 3	02-10-2019 (Wednesday)	Gandhi Jayanthi HOLIDAY
Day 4	03-10-2019 (Thursday)	
9:30 – 10:30	Lecture 6: Genomics and genotyping applications in crop improvement	Swarup K Parida, NIPGR
10:30 - 11.30	Lecture 7: Genomics in pre-breeding	Kuldeep Singh, ICAR-NBPGR
11:30 – 12:00	Tea break	
12:30 – 13:30	Lecture 8: Association mapping in crops	RK Ellur, ICAR-IARI
13:30 - 14:15	Lunch break	
14:15 – 15:15	Practical 5: Softwares for data analysis - GWAS	RK Ellur, ICAR-IARI
15:15 – 15:45	Tea break	
15:45 – 17:15	Practical 6: Softwares for data analysis - GWAS	RK Ellur, ICAR-IARI
Day 5	04-10-2019 (Friday)	
9:30 – 10:30	Lecture 9: Genome editing in crop improvement	A Mohanty, NIPGR



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10:30 - 11:30	Practical 7: Visit to rice field	PK Bhowmick, ICAR-IARI
11:30 – 12:00	Tea break	
12:30 – 13:30	Lecture 10: Genomics assisted breeding in wheat	Vinod, ICAR-IARI
13:30 - 14:15	Lunch break	
14:15 – 15:15	Lecture 11: High throughput phenotyping for disease resistance	BM Bashyal, ICAR-IARI
15:15 – 15:45	Tea break	
15:45 – 17:15	Practical 8: High throughput phenotyping for disease resistance	BM Bashyal, ICAR-IARI
Day 6	05-10-2019 (Saturday)	
9:30 – 10:30	Lecture 12: Genomics assisted breeding for nutritional quality enhancement in maize	F Hossain, ICAR-IARI
10:30 - 11:30	Practical 9: Visit to maize field	Vignesh M, ICAR-IARI
11:30 – 12:00	Tea break	
12:30 – 13:30	Lecture 13: High throughput Genotyping in crop plants	ACR Mithra, ICAR-NIPB
13:30 - 14:15	Lunch break	
14:15 – 15:15	Practical 10: Maize tool kit for genetic studies	F Hossain, ICAR-IARI
15:15 – 15:45	Tea break	
15:45 – 17:15	Practical 11: Maize tool kit for genetic studies	F Hossain, ICAR-IARI
Day 7	06-10-2019 (Sunday)	HOLIDAY
Day 8	07-10-2019 (Monday)	
9:30 – 10:30	Lecture 14: Genomics of <i>Magnaporthe</i> and its application in rice improvement	A Kumar, ICAR-IARI
10:30 - 11:30	Lecture 15: Advances in mapping gene(s)/ QTLs in crops	Gopala Krishnan S, ICAR-IARI
11:30 – 12:00	Tea break	



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12:30 – 13:30	Lecture 16: Genomics for developing diagnostic tools	VK Baranwal, ICAR-IARI
13:30 - 14:15	Lunch break	
14:15 – 15:15	Practical 12: DNA Isolation in rice/ maize	Haritha B/ Vignesh M, ICAR-IARI
15:15 – 15:45	Tea break	
15:45 – 17:15	Practical 13: Genotyping for MAS in rice/ maize	Haritha B/ Vignesh M, ICAR-IARI
Day 9	08-10-2019 (Tuesday)	DUSSEHRA HOLIDAY
Day 10	09-10-2019 (Wednesday)	
9:30 – 10:30	Lecture 17: Rapid generation advancement techniques in crop improvement	Gopala Krishnan S, ICAR-IARI
10:30 - 11.30	Lecture 18: Bioinformatics in crop improvement	AR Rao, ICAR-IASRI
11:30 – 12:00	Tea break	
12:30 – 13:30	Lecture 19: Genomic selection in crop improvement	JK Roy, NABI
13:30 - 14:15	Lunch break	
14:15 – 15:15	Practical 14: Visit to bioinformatics facility	AR Rao, ICAR-IASRI
15:15 – 15:45	Tea break	
15:45 – 17:15	Practical 15: Visit to bioinformatics facility	AR Rao, ICAR-IASRI
Day 11	10-10-2019 (Thursday)	
9:30 – 10:30	Lecture 19: Beyond genome editing: Base editors and their role in crop improvement	PK Gupta, CCSU
10:30 - 11.30	Lecture 20: Advances in genetics and genomics of foxtail millet for crop improvement of millets, cereals and bioenergy grasses	Manoj Prasad, NIPGR
11:30 – 12:00	Tea break	



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12:30 – 13:30	Lecture 21: Genomics assisted breeding in chickpea	C Bharadwaj, ICAR-IARI
13:30 - 14:15	Lunch break	
14:15 – 15:15	Practical 16: The National Gene Bank – An overview	Veena Gupta, ICAR-IARI
15:15 – 15:45	Tea break	
15:45 – 17:15	Practical 17: Visit to National Gene Bank	Veena Gupta, ICAR-IARI
Day 12	11-10-2019 (Friday)	
9:30 – 10:30	Lecture 22: Transcriptomics and its application in crops	TK Mondal, ICAR-NRCPB
10:30 - 11.30	Lecture 23: Genomics in seed quality improvement	Manjunath Prasad, ICAR-IARI
11:30 – 12:00	Tea break	
12:30 – 13:30	Lecture 24: From mapping to functional validation of genes in crops	C Viswanathan, ICAR-IARI
13:30 - 14:15	Lunch break	
14:15 – 15:15	Practical 18: Visit to phytotron facility	Kumar Durgesh, ICAR-IARI
15:15 – 15:45	Tea break	
15:45 – 17:15	Practical 19: Visit to phenomics facility	Dhandapani, ICAR-IARI
Day 12	12-10-2019 (Saturday)	
9:30 – 10:30	Lecture 25: Epigenomics and its application in crop improvement	Suresh Kumar, ICAR-IARI
10:30 - 11.30	Lecture 26: Genomics assisted breeding in vegetable crops	TK Behera, ICAR-IARI
11:30 – 12:00	Tea break	
12:30 – 13:30	Lecture 27: Molecular markers in Brassica improvement	AK Pradhan, DUSC
13:30 - 14:15	Lunch break	



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14:15 – 15:15	Post-course evaluation	
15:15 – 15:45	Tea break	
15:45 – 15:50	Welcome Address	Dr. Viswanathan C
15:50 – 16:05	Feedback from Trainees	
16:05 - 16:30	Distribution of Certificates by Chief Guest	Prof. A.K. Tyagi
16:30 – 16:35	Remarks by JD(R)	Dr. Ashok K. Singh
16:35 – 17:00	Address by Chief Guest	Prof. A.K. Tyagi
17:05 - 17:10	Vote of thanks	Dr. Gopala Krishnan S
17:10 – 17:30	High Tea	

If you need any assistance, contact:

Dr. Vinod, Professor, Genetics (8588948623)

Dr. Gopala Krishnan S, Principal Scientist (9873545505)

Dr. Ranjith K. Ellur, Scientist (8010303649)

Dr. Kumar Durgesh, Scientist (9560956688)