स्नातकविद्यालय
THE GRADUATE SCHOOL
भारतीय कृषिअनुसंधान संस्थान, नई दिल्ली–110 012
INDIAN AGRICULTURAL RESEARCH INSTITUTE
(A Deemed to be University Under Section 3 of UGC Act, 1956)
NEW DELHI - 110 012 (INDIA)

No. TGS-I/1-426/AC/2026 November 13, 2026

NOTIFICATION

The Academic Council, in its 426th meeting held on 22/06/2026 has approved the modifications in the syllabi of the following Ph.D. courses of the Discipline of Agricultural Extension Education:

1. EXT 509 (1+1)
2. EXT 601 (2+1)
3. EXT 602 (2+1)
4. EXT 603 (2+1)

The revised syllabi of the above-mentioned courses are appended to this Notification for information and necessary action.

(Piyush Shukla)
Dy. Registrar

Distribution:

1. Head/Professors of Division of Agril. Extension, ICAR-IARI
2. Associate Deans(UG/PG/Int. Affairs/ Designated Off-campuses & SIs)
3. In-charge, AKMU for uploading this notification on the website of IARI
4. PA to Dean & Jt. Director (Edn.)/PPS to Sr. Registrar

Annexure -1

Proposal for modification of syllabus of different course offered for Agricultural Extension Education degree Programme

Course Title: **ENABLING INNOVATION,** Course Code: **EXT-509**,
Credits: 2 (**1+1**), M.Sc. level

	Present	**Proposed**	**Remarks**
WHY THIS COURSE?	An effective process of agricultural innovation is a pre-condition for meeting the global challenge of feeding the growing world population and reducing poverty. Ideas about innovation have evolved considerably over the past 4 decades. A frequently used term in the discussions around innovation in agriculture is 'Agricultural Innovation Systems' (AIS). The AIS is increasingly recognized as a useful framework to diagnose innovation capacity, design investment and organise scaling up interventions. Extension and Advisory Services (EAS) are integral to AIS. Extension professionals should have sound knowledge on how to scale up new knowledge and thereby enabling innovation and impact and their roles in strengthening AIS. This course aims to provide these perspectives.	An effective process of agricultural innovation is a pre-condition for meeting the global challenge of feeding the growing world population and reducing poverty. Ideas about innovation have evolved considerably over the past 4 decades. A frequently used term in the discussions around innovation in agriculture is 'Agricultural Innovation Systems' (AIS). The AIS is increasingly recognized as a useful framework to diagnose innovation capacity, design investment and organise scaling up interventions. Extension and Advisory Services (EAS) are integral to AIS. Extension professionals should have sound knowledge on how to scale up new knowledge and thereby enabling innovation and impact and their roles in strengthening AIS. This course aims to provide these perspectives.	No Change
AIM OF THIS COURSE	The aim of this course is to introduce the new perspectives related to "innovation" and help learners to apply the AIS framework especially in dealing with scaling up knowledge. It discusses the different ways to explore AIS including the roles of different actors and the	The aim of this course is to understand diffusion of innovations and to introduce the new perspectives related to innovation" and help learners to apply the AIS framework especially in dealing with scaling up knowledge. It discusses the different ways to explore AIS including the roles of different actors	**Made more comprehensive**

	enabling environment (including institutions and policies) in enabling innovation. The course also aims to broaden the understanding of students in scaling up knowledge and orient students to varied tools and approaches to scaling up	and the enabling environment in enabling innovation. The course also aims to orient students to varied tools and approaches to scaling up.	
LEARNING OUTCOME BASED CURRICULAM FRAMEWORK	After successful completion of this course, the students are expected to be able to: - Appreciate and apply AIS framework in different contexts - Enhance their knowledge and skills related to enabling innovation - Diagnose AIS and design interventions for improvement and - Design scaling up strategies to achieve innovation and impact	After successful completion of this course, the students are expected to be able to: - Understand difference in invention and innovations in context of different extension approaches. - Gain insight how different approaches viz Technology Transfer (TT), Farming Systems Analysis (FSR), Agricultural Knowledge and Information Systems (AKIS) and Agricultural Innovation Systems (AIS) have evolved - Different actors, activities, institutes, communication channels and policy initiatives play role in different agricultural enterprises. - Different programmes and initiative taken up by Government of India and ICAR for agricultural development, - The Government of India Innovation policy	**As required in NEP 2020**

Syllabus distribution

Present Syllabus	Proposed Syllabus	Justification
Block1: AGRICULTURAL INNOVATION SYSTEMS **Unit1:Agricultural Innovation Systems: Concepts and Elements** Origins of the innovation systems concept-Innovation vs Invention; Agricultural Innovation System (AIS) - ToT, FSR, AKIS and AIS compared, Key insights from AIS: How Innovation takes place; Role of different actors in AIS; Importance of interaction and knowledge flows among different actors, Role of Communication in Innovation Process; Role of Extension in AIS, Different views to analyze AIS: structural view, functional view, process view and capacity view;**(Shifted to B2 Unit 1)** **Unit 2: Enabling Innovation** Role of enabling environment: Policies and institutions in enabling innovation; Role of Government-Innovation Policy: Achieving coordination and policy coherence; Innovation Platforms; Role	**BLOCK 1: DIFFUSION OF INNOVATION** **Unit 1: Fundamentals of diffusion of innovations** Introduction to the field: Concept and Elements of diffusion, Definitions and Differences : Discovery, Innovation, Invention, Agricultural Innovation, Agricultural practices (Package/ GAP), Typology of diffusion research especially in agriculture and meta-analysis of research traditions, The generation of innovations (The innovation development process, tracing the innovation-development process, adoption process, The concept and stages, shades of agreement, the innovation-decision process, Decision making – meaning, theories, process, steps, factors influencing decision – making), type of innovation – decisions: Optional, collective, authority and contingent innovation decisions; Theories and Models in technology adoption (Trans theoretical model, Theory of reasoned action, Theory of inter-personal behavior,	**JUSTIFICATION** **The block has been renamed and two units namely Unit I: Fundamentals of diffusion of innovations** **Unit II: Tracing adoption of innovations has been added** **Original Unit 1 (Block 1) shifted to block 2 Unit 1**

of Innovation Brokers, Methodologies for AIS Diagnosis: Typologies of existing methodologies-strengths and limitations; Assessing Extension and Advisory Services within AIS; Capacity Development in AIS: Strengthening capacities to innovate.**(Shifted to B2Unit 2)**	Theory of innovation-decision process, Decomposed theory of planned behaviour, etc.) **Unit 2 Tracing adoption of innovations** Innovativeness and adopter categories, predicting innovativeness, Simulation of innovation diffusion; Perceived attributes of innovations and their rate of adoption, determinants of rate of adoption. The diffusion effect and the concept of over adoption; flow of innovation, Consequences of innovations: Desirable or undesirable, direct or indirect, anticipated or unanticipated consequences; Change Agents, their roles, factors of their success, opinion leaders, homophily and change agent contact	
Block2: **Scaling Up Knowledge for Innovation** **Unit1:Scaling Up: Tools, Approaches and Pathways** Scaling Up: Definitions; Changing views on scaling up: Approaches to Scaling Up: Push, pull, plant, probe: Scaling up pathways: Drivers and spaces for scaling up; Framework and Tools for Scaling up: Planning and implementing a scaling up	**BLOCK 2: Innovation Systems: Policies and Scaling Innovations** **Unit 1: Agricultural Innovation Systems** Agricultural Innovation Systems: Concepts and Elements, Origins of the innovation systems concept-Innovation vs Invention Role of Communication in Innovation Process; Role of Extension in AIS, Different views to analyze AIS: structural view,	**Renamed as Unit III: Scaling knowledge and innovation** **In Block 2 and content has been retained**

pathways; Scalability assessment tools; Role of policies in scaling up: Influencing policies for scaling up; Innovation Management for scaling up knowledge and implications for Extension and Advisory Services **(Shifted to B2Unit 3)**	functional view, process view and capacity view; Methodologies for AIS Diagnosis: Typologies of existing methodologies-strengths and limitations; Assessing Extension and Advisory Services within AIS; multiple sources of innovation-farmer innovation, institutional innovation; farmer participation in technology generation and promotion; strength and limitations. **Unit II: Policies and institutions** Policies and institutions in enabling innovation; Role of Government-Innovation Policy: Achieving coordination and policy coherence; Innovation Platforms; Role of Innovation Brokers, Capacity Development in AIS: Strengthening capacities to innovate. **Unit 3 Scaling knowledge and innovation** Scaling; Conceptual clarification, Changing views on scaling up: Approaches to Scaling Up: Push, pull, plant, probe: Scaling up pathways: Drivers and spaces for scaling up; Framework and Tools for Scaling up: Planning and implementing a scaling up pathways; Scalability Assessment tools; Role of policies in scaling up: Influencing	

	policies for scaling up; Innovation Management for scaling up knowledge and implications for Extension and Advisory Services.	
PRACTICALS • Identify one crop/commodity sector and use AIS framework to diagnose actors and their roles, patterns of interaction, institutions determining interaction and the • enabling policy environment and develop a AIS Diagnosis Report (Review and Key informant interviews) • Undertake a case study on a successful case of scaling up knowledge and identify • factors that contributed to its success • Identify one specific knowledge (a technology, an approach) that has been recently • introduced and develop an Up scaling Strategy	**PRACTICALS** • Content analysis of recent adoption studies, • Field visit to study recently diffused innovations; • Case studies in process of adoption of innovations at individual. community and Organization levels, • Study of adoption of recommended practices (gradient approach in decision process at the farm level). • Assessment of farmers' perceived attributes of innovations, Identification of adopter categories and their characteristics in changing agricultural scenario, • Identification of opinion leaders in a social system, • Developing 'S' shaped curve of technology adoption in a social system. • Study of factors/ determinants of innovation diffusion and adoption, rate of adoption, presentation of reports on adoption and diffusion of innovations. • Identify one crop/commodity sector and use AIS framework to diagnose actors and their roles, patterns of interaction, institutions determining interaction and the enabling policy environment and develop a	Few topics added to make it more comprehensive

	AIS Diagnosis Report (Review and Key informant interviews) • Undertake a case study on a successful case of scaling up knowledge and identify factors that contributed to its success • Identify one specific knowledge (a technology, an approach) that has been recently introduced and develop an Up scaling Strategy	

TEACHING METHODS/ACTIVITIES

- Lecture
- Assignment (Reading/Writing)
- Student's Book/Publication Review
- Student presentation
- Group Work

RESOURCES

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World Bank. 2012. Agricultural Innovation Systems: An Investment Sourcebook. Washington DC, World Bank. http://siteresources.worldbank.org/INTARD/Resources/335807-1330620492317/9780821386842.pdf

WEBSITES

AESA-Agricultural Extension in South Asia http://www.aesanetwork.org/

FAO -Food and Agricultural Organisation (Research and Extension) http://www.fao.org/research-and-extension/en/

GFRAS- Global Forum for Rural Advisory Services http://www.g-fras.org/en/

KIT- Royal Tropical Institute (KIT)-Sustainable Economic Development https://www.kit.nl/sed/

TAPipedia - Tropical Agriculture Platform https://www.tapipedia.org/

WUR-Wageningen University and Research Research (Knowledge, Technology and Innovation Group (KTI)) https://www.wur.nl/en/Research-Results/Chair-groups/Social-Sciences/KnowledgeTechnology-and-Innovation-Group.htm

Course Title: **POLICY ENGAGEMENT AND EXTENSION,**
Course Code: **EXT-601**, Credits: 3 (**2+1**), Ph.D. level

	Present	**Proposed**	**Remarks**
WHY THIS COURSE?	Extension's performance in any country to a large extent is dependent on the wider policy and institutional context prevailing at the national level. At the organizational level, extension should have capacities to influence policies that affect their performance. To effectively influence policies, extension professionals need to generate not only sound evidence of its impact, but also capacities to engage with policy relevant actors especially at various levels. While few countries have developed specific extension policies, there has been very limited success in translating these policies into programmes and operational guidelines. Lack of policy relevant research to generate evidence on extension's impact; poor documentation of successful initiatives, and lack of training on engaging with policy relevant actors have all contributed to this. Extension professionals, often encounter situations where existing policy constraints development interventions or where new policies could	Extension's performance in any country to a large extent is dependent on the wider policy and institutional context prevailing at the national level. At the organizational level, extension should have capacities to influence policies that affect their performance. To effectively influence policies, extension professionals need to generate not only sound evidence of its impact, but also capacities to engage with policy relevant actors especially at various levels. While few countries have developed specific extension policies, there has been very limited success in translating these policies into programmes and operational guidelines. Lack of policy relevant research to generate evidence on extension's impact; poor documentation of successful initiatives, and lack of training on engaging with policy relevant actors have all contributed to this. Extension professionals, often encounter situations where existing policy constraints development interventions or where new policies could	No Change

	better support development. This course is aimed at developing these capacities to successfully engage with policy actors and bringing about desirable policy changes to strengthen extension.	better support development. This course is aimed at developing these capacities to successfully engage with policy actors and bringing about desirable policy changes to strengthen extension.	
AIM OF THIS COURSE	• To orient students on the importance of policies in shaping extension's performance • To discuss ways of generating policy relevant evidence to influence policies • To develop capacities to engage with policy actors and the policy development • process	• To orient students on the importance of policies in shaping extension's performance • To discuss ways of generating policy relevant evidence to influence policies • To develop capacities to engage with policy actors and the policy development process	**No Change**
LEARNING OUTCOME BASED CURRICULAM FRAMEWORK	After successful completion of this course, the students are expected to be able to: - Appreciate the role of policies in shaping performance of extension - Understand how to generate and communicate policy relevant evidence - Critically evaluate extension policies in different countries - How to engage in policy advocacy	After successful completion of this course, the students are expected to be able to: - Realize and clearly define the role of policies in shaping performance of extension - Able to generate and communicate policy relevant evidence - Critically evaluate extension policies in different countries - Able to write down the practices followed for policy advocacy	**Made more comprehensive as required in NEP 2020**

Syllabus Distribution

Present	Proposed	JUSTIFICATION/ Remarks
Block1:Why Policies Matter? **Unit1:Understanding Policy** Understanding Policy Why policies are important for extension? Role in providing structure, ensure funding and framework for providing functions-examples; Policy: definitions and types: Is policy a product or a process or both? Policies and institutions-How these influences defining organizational roles and performance in extension organizations-Role of policies in upscaling knowledge-Role of extension in influencing policies to enable innovation. **Unit 2 :Policy Advocacy and Tools** Definition of advocacy, Approaches to policy advocacy-Advising, Media campaigning, Lobbying, Activism, Information Education Communication (IEC) and Behavior Change Communication (BCC); Advocacy for Rural Advisory Services (RAS); Policy advocacy strategy **(Shifted to Block 2)**	**Block1:Why Policies Matter?** **Unit1:Understanding Policy** Understanding basics of Policy: meaning, type, framework, policy instruments, models, stages, who makes policies. Policies and institutions-influence in organizational roles, performance, upscaling knowledge. Why policies are important for extension? Role in providing structure, ensure funding and framework. Role of extension in influencing policies to enable innovation Extension polices in India: History, lessons learnt since independence. **Unit 2 :Policy Development Process** Policy development process: Stages problem identification, agenda setting, policy formulation, policy adoption, implementation and evaluation. Drivers of policy change and varied experiences (National Governments, donors, civil society). Understanding the environment and key actors in policy space,	**Reworded as per logical sequence and added the topic relevant for the Indian extension policy** **Reworded, sequence changed in Block 1**

Unit 3 :Policy Development Process Policy development process: Who drives policy change?: National Governments, Donors, Civil Society-varied experiences: Understanding the environment and key actors in policy space-problem identification-policy adoption, implementation and evaluation; stakeholder mapping, identifying opportunities and barriers, mobilising financial resources; Dealing with policy incoherence: identifying contradictions and challenges in policy implementation **Unit 4 :Policy Analysis** Explain the meaning and use of policy analysis in decision- making; Describe different types of policy analysis-empirical, evaluative or normative policy analysis, retrospective/ prospective policy analysis, predictive/prescriptive/descriptive policy analysis; How to do policy analysis? - understand the process of policy analysis, highlight the different methods and techniques used in policy analysis, doing ethical policy analysis; Tools for policy impact- research tools, context assessment tools, communication	stakeholder mapping, identifying opportunities and barriers, mobilising financial resources. Dealing with policy incoherence: identifying contradictions and challenges in policy implementation **Unit 3 :Policy Development Process** Meaning and use of policy analysis in decision-making. Types of policy analysis- empirical, evaluative or normative policy analysis, retrospective/ prospective policy analysis, reductive/prescriptive/descriptive policy analysis. Policy analysis': Process, methods and techniques, ethics. Generating evidence: usefulness and appropriateness. role of policy research. Tools for policy impact- research tools, context assessment tools, communication tools, policy influence tools	**Reworded and rearranged. sequence changed in Block 1**

tools, policy influence tools		
Block2:**Using Evidence to Influence Policy Change** **Unit1:Influencing Policy Change:** **Policy Advocacy** Definition of advocacy, Approaches to policy advocacy-Advising, Media campaigning, Lobbying, Activism, Information Education Communication (IEC) and Behavior Change Communication (BCC); Advocacy for Rural Advisory Services (RAS); Policy advocacy strategy **Unit2: Influencing Policy Change: Policy communication and engagement** Extension policy in different countries: Explicit extension policy Vs extension as part of Agriculture Policy, Challenges in policy implementation: lack of capacities, financial resources, ownership, lack of stakeholder consultations: Strengthening capacities in extension to influence policies: Global Forum for Rural Advisory Services (GFRAS)'s efforts in strengthening extension policy advocacy: policy compendium, training modules, training for strengthening capacities to influence policies.	**BLOCK 2: Using Evidence to Influence Policy Change** **Unit 1: Influencing Policy Change: Policy Advocacy** Understanding advocacy: approaches to policy advocacy-Advising, Media campaigning, Lobbying, Activism, Information Education Communication (IEC) and Behavior Change Communication (BCC); Advocacy for Rural Advisory Services (RAS); Policy advocacy strategy. Evidence-based policy advocacy. Understanding audience: analyzing channels of influence, creating alliances, identifying policy champions. **Unit2: Influencing Policy Change: Policy communication and engagement** Policy communication: Policy papers, Policy briefs, good practice notes, ICT and social media messages, blogs etc. Organizing policy dialogues. Policy engagement strategy-engaging with policymakers, GO and NGO experiences; Policy working groups; advisory panels; use of committees. Unit 3: **Global Experience with Extension Policy** Extension policy in a few prominent	**Rearranged logically in Block 1, Unit 3 and Block 2, Unit 1 and 2** **Retained.** **Added topic from earlier Block 2, Unit 1.** **Created from Earlier Block 2, unit 1**

Unit3: Global Experience with Extension Policy Extension policy in different countries: Explicit extension policy Vs extension as part of Agriculture Policy, Challenges in policy implementation: lack of capacities, financial resources, ownership, lack of stakeholder consultations: Strengthening capacities in extension to influence policies: Global Forum for Rural Advisory Services (GFRAS)'s efforts in strengthening extension policy advocacy: policy compendium, training modules, training for strengthening capacities to influence policies.	countries from all continents (USA, England, Brazil, South Africa, China, Australia). Explicit extension policy Vs extension as part of Agriculture Policy. Strengthening capacities in extension to influence policies: Institutions/forums' role in strengthening extension policy advocacy: policy compendium, training modules, training for strengthening capacities to influence policies.	**Re-worded**
Practical 1. Analysis of country/state level agricultural/extension policy to understand the policy intentions from strengthening EAS 2. Analysis of extension policy of other countries: policy intentions, processes adopted in development of the policy and mechanisms of policy implementation 3. Interview key policy actors in EAS arena at the state/national level (eg: Director of Agriculture,	**Practical** 1. Analysis of country/state level agricultural/extension policy to understand the policy intentions from strengthening EAS 2. Analysis of extension policy of other countries: policy intentions, processes adopted in development of the policy and mechanisms of policy implementation 3. Interview key policy actors in EAS arena at the state/national level (eg: Director of Agriculture, Director of Extension in SAU, Chairman/Managing	**No Change**

Director of Extension in SAU, Chairman/Managing Director of Commodity Board. Member Agriculture, State Planning Board) to explore policy level challenges in EAS. 4. Identify what evidence policy makers look for from extension research? Is theevidence available? If so what form? (Reports, Briefs etc), If not, develop a plan 5. Explore how different stakeholders influence policies (eg: policy advocacy of prominent NGOs, private sector and public sector) -What mechanisms and tools they use 6. Identify policy level bottlenecks that constrain effective EAS delivery at the district level- Eg: Issues around linkages between KVK and ATMA; inter-departmental collaboration; public private partnerships; joint action etc.	Director of Commodity Board. Member Agriculture, State Planning Board) to explore policy level challenges in EAS 4. Identify what evidence policy makers look for from extension research? Is the evidence available? If so what form? (Reports, Briefs etc), If not, develop a plan 5. Explore how different stakeholders influence policies (eg: policy advocacy of prominent NGOs, private sector and public sector) -What mechanisms and tools they use 6. Identify policy level bottlenecks that constrain effective EAS delivery at the district level- Eg: Issues around linkages between KVK and ATMA; inter-departmental collaboration; public private partnerships; joint action etc.	

TEACHING METHODS/ACTIVITIES

- Lecture
- Assignment (Reading/Writing)
- Student's Book/Publication Review
- Student presentation
- Group Work
- Student's interview of key policymakers
- Case Analysis
- Guest Lectures
- Review of policy documents
- Short attachments

- Visit to organisations related to policy

RESOURCES

Public Policy Analysis: An Introduction by William N. Dunn

Understanding Public Policy: Theories and Issues by Paul Cairney

AEPF. 2015. Report on the Policy Forum by Ghana Directorate of AgriculturalExtension Services, Ministry of Food and Agriculture; Modernizing Extension and Advisory

Services and Agriculture Policy Support Project, Ghana. http://www.g-fras.org/en/knowledge/documents/category/18-policy.html?download=490:report-on-theghana-agricultural-extension-policy-forum-2015

Amosa, MDU. 2018. Policy Analysis and Engagement Toolkit. A guide for Pacific Nongovernment Organizations in the Fisheries Sector. WWF. http://d2ouvy59p0dg6k.cloudfront.net/downloads/policy_analysis_toolkit_quality.pdf

Anonymous.N.d. Policy analysis. http://www.egyankosh.ac.in/bitstream/123456789/25760/1/Unit-19.pdf

Anonymous.N.d. Policy analysis. https://web.csulb.edu/~msaintg/ppa670/670steps.htm

Bardach E. A Practical Guide for Policy Analysis The Eightfold Path to More EffectiveProblem Solving Fourth Edition. Sage Publications.CQPress.http://dlib.scu.ac.ir/bitstream/Ebook/32773/2/9781608718429.pdf

Cairney P. 2015.Chapter 2: Policymaking in the UK: What is Policy and How is itMade?.Policy and Policymaking in theUK.https://paulcairney.files.wordpress.com/2013/08/chapter-2-20-8-13-cairney-policypolicymaking-uk.pdf

CRISP, MANAGE and ICAR-ATARI.2016. Training cum workshop on StrengtheningExtension Policy Interface at MANAGE on 9-11th Nov, 2016 in collaboration with theCRISP & ICAR-ATARI, Bangalore. http://crispindia.org/index.php/events/

DAC. 2000. POLICY FRAME WORK FOR AGRICULTURAL EXTENSION. Departmentof Agriculture and Cooperation, Ministry of Agriculture, Government of Indiahttps://sameti.org/Policy%20Framework%20for%20Agricultural%20Extension.pdf

DAFF.n.d. National Policy on Extension and Advisory Services for Agriculture, Forestry and Fisheries.Department of Agriculture, Forestry and Fisheries, Republic of South Africa.https://www.daff.gov.za/doaDev/topMenu/National%20Policy.pdf

Douglas JA.1984.Why policy analysis and ethics are incompatible. Journal of PolicyAnalysis and Management.https://doi.org/10.1002/pam.4050030407

Dube L, Nii A Addy, Blouin C and Drager N. 2014. From policy coherence to 21st centuryconvergence: A whole-of-society paradigm of human and economic development. Annals of the New York Academy of Sciences. 1331: 201–215.https://nyaspubs.onlinelibrary.wiley.com/doi/epdf/10.1111/nyas.12511

FAO. 2013. FAO Policy on Gender Equality. Attaining Food Security Goals in Agriculture and Rural Development. Food and Agriculture Organization of the United Nations, Rome. http://www.fao.org/docrep/017/i3205e/i3205e.pdf

FAO. 2018. Policy Guidance Series. Strengthening Sector Policies for Better Food Security and Nutrition Results. Food and Agriculture Organization of the United Nations, Rome. http://www.fao.org/publications/policy-guidance-series/en/

Course Title: **METHODOLOGIES FOR SOCIAL AND BEHAVIOURAL RESEARCH,**
Course Code: **EXT-602**, Credits: 3 (**2+1**), Ph.D. level

	Present	**Proposed**	**Remarks**
WHY THIS COURSE?	In general, social and behavioural science research plays a crucial role in the professional development in a subject domain, through advancing knowledge and developing working modalities and standards. Precisely, the empirical research helps to develop robust and outcome focused working strategies, processes and models to enable the professionals to maximise their efficiency. This course on advanced social science research caters to the need to equipping the scholars with essential skills in conducting high quality research which helps them to design working strategies, processes and models for professional development.	Research is important for creation and advancement of knowledge as well as theory building to explain and predict the various phenomena in our surroundings. Also, the growth and relevance of any subject largely depend upon the quality of the research outcomes. It is impossible to do competent research and obtain objective as well as verifiable evidences and inferences without understanding and applying statistical tools and techniques. Realizing the significance of the excellence in pursuit of scientific enquiry into the phenomena related to social and behavioural processes, there is growing emphasis upon capacity development of scientific manpower in application of robust measurement theory, designs and analytics. As the behavioural research is multivariate in nature, precision in measurement could be obtained only through advanced psychometrics and multivariate statistics. Therefore, the course content has been adequately customized for social and behavioural research carried out in the discipline of Agricultural Extension. The course will broaden the research orientation as well as enhance the skills of	Streamlined as per needs

		the students to pursue fundamental and basic researches in the discipline.	
AIM OF THIS COURSE	This course aims to equip the doctoral students to conduct outcome-oriented social and behavioral science research and to develop sound field focused extension strategies and models with adequate replicability, while advancing knowledge on processes governing success of those strategies. The focus of the course is on equipping the scholars with advanced capacities in conducting systematic, objective and outcome oriented research by applying state-of-art methods and tools at every stage of research from planning to publishing.	The basic aim of the course to strengthen the competency of research scholars in conceptualization and undertaking quality research with use of appropriate theoretical frameworks, research designs and higher order data analytics. It further aims to provide motivation towards basic research with ethical considerations in the discipline of Agricultural Extension.	Reworded to make comprehensive
LEARNING OUTCOME BASED CURRICULAM FRAMEWORK	- The scholars should develop critical skills in conducting systematic and objective research by using robust methods while minimising biases and errors - The students should intelligently choose and apply advanced methods and tools at every stage of research and execute them in a objective way by managing the actors and processes effectively. - The students should develop expertise in designing tests, scales and indexes along with other tools to measure the socio-psychological processes at individual, group and community levels	Upon successful completion of the course, students will be able to: - Design theoretical and conceptual frameworks for a research study with identification of appropriate and novel constructs. - Apply different kinds of research designs, particularly experimental and quasi- experimental designs, while abstaining from faulty designs - Apply advanced psychometrics for development of scales and tests meeting the standards of dimensionality, reliability, and validity. - Develop indices and models with appropriate methodologies. - Apply parametric, non-parametric as	Made more comprehensive as required in NEP 2020

		well as multivariate analytics - Use softwares for qualitative as well as quantitative analysis - Apply advanced research methodologies, including qualitative methods, mixed methods research, to address complex research questions. - Demonstrate ethical conduct in all aspects of research, including human subject research, Indigenous knowledge collection, and publication practices like plagiarism - Effectively communicate research findings through scholarly publications, - presentations, and digital media platforms. - Engage in practical exercises and fieldwork to apply theoretical knowledge in real- world research settings. These outcomes are designed to equip students with the skills and competencies necessary to conduct rigorous and ethical research.	

Syllabus Distribution

Present	Proposed	Justification/ Remarks
Block1:Advanced Methods for Improving Quality of Research Data **Unit 1:Measurement Properties of Research Instruments** Measurement properties Dimensionality, reliability and validity; Dimensionality Uni dimensionality and multidimensionality, Methods of assessing dimensionality, Formative and reflective constructs; Validity - Importance, Internal validity - face validity; content validity, Substantive Validity, Structural Validity; External validity. Convergent and Discriminant Validity, known-group validity, Criterion-Related Validity, Consequential Validity, nomological validity; Methods of assessing various forms of validities – Judges rating, Lawshe's Content Validity Ratio, Item-objective congruence index; latent variable method; Reliability - Internal consistency reliability. Split-Half, Cronbach alpha; Temporal Stability reliability - test-retest method; Interrater Consistency and Consensus – inter rater reliability and interrater agreement; Alternative Forms or parallel forms reliability – Reliability of difference. Factors Affecting the Validity and Reliability of Test Scores; Generalizability	**Block1:Basics of Social and Behavioural Research** **Unit I: Foundations of Social and Behavioural Research** Philosophy of Science in Research: Understanding positivism, interpretivism, and constructivism as research paradigms. Theoretical Frameworks and Models: Role of theories in social and behavioral sciences; developing conceptual models. Behavioural Science Concepts: Key constructs, variables, and dimensions in understanding human behavior, including the identification and operationalization of constructs, variables, and dimensions. Emerging trends and contemporary challenges in social research **Unit II: Measurement Properties & Data Quality** Measurement properties -Dimensionality, reliability and validity, Errors and biases; Errors – Meaning and sources; Types - Sampling error, Non- sampling or measurement error. Methods of reducing errors and biases in surveys, questionnaires, personal interviews, focus groups and online methods	Unit 1 of the proposed syllabus has been added to address the gap present in the BSMA syllabus, highlighting the importance of understanding diverse philosophies in social science research. The content of BSMA Units 1 and 2 has been combined and repositioned as Unit II in the proposed syllabus

Theory **Unit2:Threats to Data Quality** Errors and biases; Errors – Meaning and sources; Types - Sampling error, Non- sampling or measurement error and Processing error – Meaning, causes; Effects of errors and biases on data quality; Bias in behavioral research – Meaning, causes, Types – Respondent and researcher biases; Methods of reducing errors and biases in surveys, questionnaires, personal interviews, focus groups and online methods		
Block2: Scales, Indexes and Tests **Unit1:Scales, Indexes and Tests-1** Approaches to measurement and scale development - Classical test theory. Formative or index models, The C–OAR–SE approach and Item Response Theory; Item analysis in Classical test theory – item difficulty and item discrimination; Scoring performance in scales and tests – meaning, types and methods; Scale development strategies – deductive and empirical; Stimulus-centred scales – method of equally appearing intervals, paired comparison, Person scaling – Q methodology; Subject-centre scales – The Likert scale and Semantic Differential **Unit2: Scales, Indexes and Tests-2** Steps in constructing a multi-dimensional scale using confirmatory factor analysis, Response scales - Guttman's scalogram analysis and The	**BLOCK 2: Research Design & Research Instrument** **Unit 1: Research Design and Sampling Techniques** Concepts of hypothesis, types of research designs – descriptive, exploratory, explanatory, and diagnostic, Experimental and Quasi-Experimental Designs: Concepts, applications, and limitations; designing controlled and field experiments. Concepts in Sampling: Sampling frame, sampling design and techniques: Probability and non- probability sampling **Unit 2: Scale, Indexes & Tests** Introduction to construction of psychological test and scales. Thurstone's Paired Comparison and Equal Appearing Interval; scales Likert scale, and Guttman scale, and. Methods of constructing a multi-dimensional scale using confirmatory factor analysis. Concept and methods of constructing Index, differences with scales, Methods of constructing indexes	Block 2 Unit I of the proposed syllabus are added which cover different research designs and sampling techniques used in the social science research The content of BSMA Block 2 : Units 1 and 2 have been combined and repositioned as

Rasch method; Indexes –Meaning, types, importance; Similarities and differences with scales, Methods of constructing indexes; Common indexes used in extension. Measurement invariance –Meaning, types, methods of assessing measurement invariance. Tests – meaning, types, importance; steps in conducting various tests – knowledge test.		Block 2 Unit 2 in the proposed syllabus.
Block 3 : Emerging Research Approaches and Designs **Unit1:Qualitative Research Methods** Qualitative methods – Meaning; Types – Ethnography, Grounded theory, Phenomenology, Ecological psychology, Discourse Analysis; Observational research; Case study research – Sampling and sample size; Data collection methods - In- depth interviews, Focus groups, Direct observation, Record review; Content analysis; Unobtrusive Measures; Projective and semi-projective techniques; Selecting right qualitative method – Strengths and limitations of qualitative research; Analysis and interpretation of qualitative research data; Research synthesis – meaning, importance, methods; Systematic reviews and meta-analysis – meaning, steps, and applications; Policy research **Unit2: Emerging Approaches** Mixed methods research – meaning, purpose, types and applications; Participatory research – Meaning, importance, types, methods and tools and	**Block 3 : Emerging Research Approaches** **Unit1: Quantitative and Qualitative approaches** Introduction to quantitative, qualitative and Mixed methods approaches, Application of linear and non-linear (logit, Probit and Tobit) regression models in social research; Data reduction and identification of constructs with Factor analysis. Application of Non-parametric tests in social research Qualitative methods – Meaning; Types – Ethnography, Grounded theory, Phenomenology, Experimental designs for farmer participatory research and On-farm technology assessment; Case study research. Content analysis; Strengths and limitations of qualitative research; Analysis and interpretation of qualitative research data; Systematic reviews and meta-analysis – meaning, steps, and applications; **Unit 2 : Emerging Research Approaches-I** Predicting farmers' preferences with conjoint	Block 3 Unit I of the proposed syllabus rearranged the content from Block 3 Unit 1 of the BSMA as per the student's demand

applications; Action research – Meaning, importance, Principles, Types, steps in conducting action research, application in behavioural sciences. Social Network Analysis – Meaning, importance, types, steps in social network analysis, applications; Advanced methods of measuring perception and beliefs. Multi criteria decision making, analytical hierarchy approach	analysis; Determining farmers' typologies with Cluster Analysis, Measures of Similarity or Dissimilarity, Perceptual mapping (Multidimensional Scaling) with metric and non-metric attributes; Communication and Social network analysis, Approaches to classification; Classification Analysis; Ranking techniques; Livelihood Vulnerability analysis **Unit3 :Emerging Research Approaches-II** Application of Structural Equation Modelling for adoption decision; ISM Simulation research in behavioral science; Agent based modeling; Diffusion modeling; Handling panel data, Trend analysis, Delphi technique. Multi criteria decision making, analytical hierarchy approach.	Rearranged and rewording of the content has been done

Block 4 : Utilizing Research Outputs **Unit1:Publishing Research** Scholarly communication process; Research reports – Meaning, types, contents; Presentations – Meaning, types, principles of good presentation - Tell 'Em" and KISS 'Em" principles; Research publications – meaning, importance, types; Guidelines for preparing research papers - Peer review process, citation styles; Open access publishing; Publishing in social media. Software in academic writing **Unit 2 :Ethics in Extension Research** Ethics in conducting behavioural research; Human subject research – Meaning, history, and ethical guidelines; Ethical aspects of collecting and using Indigenous knowledge and farmer's technologies; Ethical practices in publishing; Plagiarism – meaning, sources, Identifying and correcting plagiarism in a research paper using anti-plagiarism software	**Block 4 : Utilizing Research Outputs** **Unit1 : Utilizing Research Outputs** Use of RMT (reference management tools) Writing Research Proposals and Scientific Papers, Software in academic writing & Data analysis, Plagiarism – meaning, sources, Identifying and correcting plagiarism in a research paper using anti-plagiarism software	The BSMA Block4 has been completely deleted as the content of the unit1 & Unit 2 are already covered in other courses. In proposed syllabus Under Block 4 Unit I has been added

PRACTICAL - Practice in developing research instruments - Methods of assessing measurement properties of research instruments - dimensionality, reliability and validity - Hands-on exercise in minimising errors and biases - Hands-on experience in constructing tests, scale and indexes - Practice in summated scale development using confirmatory factor analysis - Hands on experience in assessing measurement invariance - Practicing and collecting data using participatory tools and techniques, analyzing and interpreting qualitative data - Hands-on experience in writing systematic review using meta-analysis - Field practice in conducting action research - Practical experience in writing research paper - Hands on exercises using software for qualitative data analysis - Practice in detecting and correcting plagiarism using software	**PRACTICAL** - Development of framework and conduction of Household vulnerability analysis of IARI model village/adopted village; - Conducting regression analysis with software (SPSS/STATA), inference making and describing the results; - Conducting discriminant analysis with software (SPSS/STATA)inference making and describing the results; Identifying adopters' typologies and Conducting cluster analysis with software (SPSS/STATA), inference making and describing the results; - Identification of technological preferences of farmers with conjoint analysis; Identification of social and communication network among farmers using network analysis (UC NET software); - Conducting path analysis with software (SPSS/STATA), inference making and describing the results; Simulation modeling of adoption behavior of farmers; - Forecasting adoption of technology through Delphi method; Data Collection on ethno-botany; Planning experimental designs for technology assessment trials and analysis of data with KVK and CATAT.	Made more need oriented

TEACHING METHODS/ACTIVITIES

- Lecture
- Assignment(Reading/Writing)
- Student presentation
- Group Work
- Guest Lectures
- Research Report (Writing)

RESOURCES

- Alyan Bryman.2004. Social Research Methods. Oxford University Press
- Berg B. 2009. Qualitative Research. Methods for the Social Sciences. Boston: Allyn& Bacon.
- Creswell JW .2007. Qualitative inquiry and research design: Choosing among five approaches (2nd ed.). Thousand Oaks, CA: SAGE Pub.
- Edwards AL. 1957. Techniques of attitude scale construction. East Norwalk, CT, US: Appleton-Century-Crofts.
- Furr, RM. 2011.Scale construction and psychometrics for social and personality psychology. Los Angeles: SAGE Pub.
- Gujarati, D.N. & Porter, D.C. 2009. Basic Econometrics (5th Ed.). New York: McGraw Hill.
- Hair, JF. Black, W.C.;Babin, BJ.; Anderson, RE; and Tatham, RL;2013. Multivariate data analysis. Pearson Education.
- http://www.aesanetwork.org/wp-content/uploads/2018/07/6.pdf
- Lisa M Given. 2008. The SAGE Encyclopedia of Qualitative Research Methods. University of Alberta. Sage Publications.
- Malhotra, NK. 2010. Marketing research: An applied orientation. Sixth Edition. Upper Saddle River, NJ: Prentice Hall Pub.
- Netemeyer RG, Bearden WO and Sharma S. 2003.Scaling procedures: issues and applications. Thousand Oaks: SAGE Publications
- Nunnally,JC, and Bernstein IH. 1994. Psychometric theory (3rd ed.). New York, NY: McGraw-Hill
- Randal E Schumacker. 2015. Using R with multivariate statistics. Sage Publications
- Rao,C,R and Sinharay S. 2007. Handbook of Statistics, Vol. 26: Psychometrics, The Netherlands; Elsevier Science B.V.
- Raykov T and Marcoulides GA. 2010.Introduction to Psychometric Theory. New York, NY: Taylor & Francis
- Raymond A Kent. 2015. Analyzing quantitative data. Sage Publications
- Scott J and Carrington PJ. 2011. The SAGE handbook of social network analysis. London: SAGE.
- Sekaran U and Bougie R. 2013. Research Methods for Business A Skill-Building Approach. 6th Edition, Wiley, New York.
- Sivakumar PS, Sontakki BS, Sulaiman RV, Saravanan R and Mittal N. (eds). 2017. Good Practices in Agricultural extension Research. Manual on Good Practices in Extension Research and Evaluation. Agricultural Extension in South Asia. Centre for research on innovation and science and policy (CRISP), Hyderabad. India.

Course Title: **TECHNOLOGY COMMERCIALISATION & INCUBATION,**
Course Code: **EXT-603**, Credits: 3 (**2+1**), Ph.D. level

	Present	**Proposed**	**Remarks**
WHY THIS COURSE?	The technology commercialisation and incubation is an emerging area which links technology development, transfer and commercialisation processes with entrepreneurship development. Technology commercialisation aims to realize the value of agricultural technologies developed at the research establishments, by maximising their utility to stakeholders. With the increasing awareness of protecting and commercialising the Intellectual Property Resources (IPR) in the free market economy, there is a need to understand the organic relationship between protection and commercialisation IPR, and entrepreneurship development.	The technology commercialisation and incubation is an emerging area which links technology development, transfer and commercialisation processes with entrepreneurship development. Technology commercialisation aims to realize the value of agricultural technologies developed at the research establishments, by maximising their utility to stakeholders. With the increasing awareness of protecting and commercialising the Intellectual Property Resources (IPR) in the free market economy, there is a need to understand the organic relationship between protection and commercialisation IPR, and entrepreneurship development.	No Change
AIM OF THIS COURSE	This course is aimed to develop a critical understanding among extension students about how the technology commercialisation process is linked to IPR management and entrepreneurship development.	This course is aimed to develop a critical understanding among extension students about how the technology commercialisation process is linked to IPR management and entrepreneurship development.	No Change
LEARNING OUTCOME BASED	At the end of the course the students are expected to develop competencies in - Enabling stakeholders to protect and	**Upon successful completion of the course, students will be able to:** - Acquire and demonstrate interpersonal and negotiation skills in marketing,	**Made more comprehensive as required in**

CURRICULAM FRAMEWORK	manage their IPR - Managing IPR to maximise their value realisation through commercialisation, and - Providing mentoring and handholding support to agripreneurs, rural entrepreneurs, start-ups, Farmer Organisations and other forms of entrepreneurs through incubation	networking, and communication for technology transfer, and commercialization. - Comprehend and explain the process of technology transfer, technology scouting, commercialization, different types of intellectual property and importance of IPR management in protecting innovations. - Evaluate the feasibility and potential impact of technologies in order to refine them based on market needs and feedback. - Understand and prescribe the legal and financial aspects of technology licensing agreements and negotiations. - Mapping the ecosystem of technology incubation in India, including government policies and initiatives.	**NEP 2020**

Syllabus Distribution

Present	Proposed	Justification/ Remarks
Block1:Technology Commercialisation and the Modern Technology **Unit1:Basics of Technology Commercialisation** Technology - Definition, Functions, Process of Technological Advancement – Invention, Discovery, Innovation and Technology; Types of Innovation - Basic Research, Breakthrough Innovation, Disruptive Innovation and Sustaining Innovation; Technology Transfer and Commercialization. **Unit2:Nature of Agricultural Technology** Agricultural Technology – Technology Generation System; Technology Life Cycle **Unit 3 : Basics of Technology Transfer and Commercialization** Technology Transfer vs Commercialization; Technology Commercialization Process – Elements, Models, Systems and Processes; Technology Transfer Model – Research,	**Block1:Technology Commercialisation and the Modern Technology** **Unit1:Basics of Technology Commercialisation** Technology - Definition, Functions, Process of Technological Advancement – Invention, Discovery, Innovation and Technology; Types of Innovation - Basic Research, Breakthrough Innovation, Disruptive Innovation and Sustaining Innovation; Technology Transfer and Commercialization **Unit2:Basics of Technology Transfer and Commercialization** Technology Transfer vs Commercialization; Technology Commercialization Process – Elements, Models, Systems and Processes; Technology Transfer Model – Research, Disclosure, Development and Commercialization **Unit 3: Technology Commercialization Strategies** Meaning- Approaches for Technology Commercialisation – Technology Scaling Up, Technology Licensing, Handholding, Agripreneur Development, Technology Business Incubation	Unit 1 No Change Unit 2 Deleted as superfluous No Change

Disclosure, Development and Commercialization **Unit 4: Technology Commercialization Strategies** Meaning- Approaches for Technology Commercialisation – Technology Scaling Up, Technology Licensing, Handholding, Agripreneur Development, Technology Business Incubation		Block 3 unit 3 Added here and deleted from original block 3 to make the flow smooth.
Block2:Intellectual Property Resources (IPR) Management **Unit1:Overview of Intellectual Property Resources** Introduction to IPR; Overview & Importance; Genesis; IPR in India and IPR abroad; Patents, Copyrights, Trademarks & Trade Secrets, Geographical Indication, Industrial Design; Emergence of IPR Regimes and Governance Frameworks - Trade-Related Aspects of Intellectual Property Rights (TRIPS), Convention On Biological Diversity (CBD), Cartagena Protocol, International Union For Protection Of New Plant Varieties (UPOV), And BIMSTEC.	**Block2:Intellectual Property Resources (IPR) Management** **Unit1:Overview of Intellectual Property Resources** Introduction to IPR; Overview & Importance; Genesis; IPR in India and IPR abroad; Patents, Copyrights, Trademarks & Trade Secrets, Geographical Indication, Industrial Design; Emergence of IPR Regimes and Governance Frameworks - Trade-Related Aspects of Intellectual Property Rights (TRIPS), Convention On Biological Diversity (CBD), Cartagena Protocol, International Union For Protection Of New Plant Varieties (UPOV), And BIMSTEC. **Unit2: Systems for Protecting IP** IPR Protection Laws And Systems – National IPR	No Change

Unit2: Systems for Protecting IP IPR Protection Laws And Systems – National IPR Policy;IPR Laws; Procedures For Filing IP Protection; Systems Of IP Protection And Management In Agricultural Universities And Research Institutions And Also By Stakeholders **Unit3:Management of IPR** Mechanisms of IPR Management – Institutional Arrangement, IP Management Processes –Invention Disclosure; IP Portfolio Management; Infringement Management **Unit4:Protection and Management of Biological Resources** – Introduction; National Biodiversity Act (2002); Protection Of Plant Varieties And Farmers Rights Act (2001); Guidelines For Registration And Transfer Of Biological Resources; Farmers Rights; Mechanisms Of Documenting/ Collecting, Protecting and Commercializing Farmers Varieties And Other Biological Resources;	Policy;IPR Laws; Procedures For Filing IP Protection; Systems Of IP Protection And Management In Agricultural Universities And Research Institutions And Also By Stakeholders Mechanisms of IRP Management – Institutional Arrangement, IP Management Processes –Invention Disclosure; IP Portfolio Management; Infringement Management **Unit3: Protection, Management and Commercialization of Grassroot and Farmers Innovations, Traditional and Indigenous Knowledge. Geographical Indications (Gi) And Appellation of Origin** Traditional and Indigenous Knowledge, Grassroot And Farmers Innovations – Meaning, Forms and Importance; Systems Of Documentation, Registration, Protection And Commercialization. Documentation of Traditional Indigenous Knowledge – Traditional Knowledge Digital Library (TKDL), Community Biodiversity Registers (CBRS, People's Biodiversity Registers (PBRS), Plant Biodiversity Register, And Honeybee Network. **Unit 4: Geographical Indications (GI) And Appellation of Origin** Geographical Indications and Appellation of Origin – Meaning, Origin; Geographical Indications of Goods (Registration and Protection) Act (1999); Documentation, Registration and	No Change Merged with Unit 2 Merged with Unit 1

National Biodiversity Authority, PPVFRA And Other Agencies Involved In Management Of Biological Resources In India. Access to Genetic Resources and Sharing of Benefits. **Unit5: Protection, Management and Commercialization of Grassroot and Farmers Innovations, Traditional and Indigenous Knowledge. Geographical Indications (GI) and Appellation of Origin** Traditional and Indigenous Knowledge, Grassroot And Farmers Innovations – Meaning, Forms and Importance; Systems of Documentation, Registration, Protection and Commercialization. Documentation of Traditional Indigenous Knowledge – Traditional Knowledge Digital Library (TKDL), Community Biodiversity Registers (CBRS), People's Biodiversity Registers (PBRS), Plant Biodiversity Register, And Honeybee Network. **Unit6: Geographical Indications (GI) and Appellation of Origin** Geographical Indications and Appellation of Origin – Meaning, Origin; Geographical Indications of Goods (Registration and	Commercialization Of GI Protected Materials and Processes. **Unit 5 : Genetically Modified Organisms (GMO), Agriculture and Biosafety** The Global Concerns On Use Of Genetically Modified Organisms In Food And Agriculture; The Cartagena Protocol On Bio-Safety; Regulation Of GMO In India - Recombinant DNA Advisory Committee (RDAC), Institutional Bio-Safety Committee (IBSC), Review Committee On Genetic Manipulation (RCGM), Genetic Engineering Approval Committee (GEAC), State Bio-Safety Coordination Committee (SBCC) And District Level Committee (DLC). Laws and Acts for Regulation of GMO -Guidelines For Research In Transgenic Plants, 1998; Seed Policy, 2002; Plant Quarantine Order, 2003; Regulation For Import Of Gm Products Under Foreign Trade Policy, 2006; National Environment Policy, 2006	Unit 5 & 6 Merged

Protection) Act (1999); Documentation, Registration and Commercialization Of GI Protected Materials And Processes. **Unit7: Genetically Modified Organisms (GMO), Agriculture and Biosafety** The Global Concerns On Use Of Genetically Modified Organisms In Food And Agriculture; The Cartagena Protocol On Bio-Safety; Regulation Of GMO In India - Recombinant DNA Advisory Committee (RDAC), Institutional Bio-Safety Committee (IBSC), Review Committee On Genetic Manipulation (RCGM), Genetic Engineering Approval Committee (GEAC), State Bio-Safety Coordination Committee (SBCC) And District Level Committee (DLC). Laws and Acts For Regulation Of GMO - Guidelines For Research In Transgenic Plants, 1998; Seed Policy, 2002; Plant Quarantine Order, 2003; Regulation For Import Of Gm Products Under Foreign Trade Policy, 2006; National Environment Policy, 2006		No Change
Block 3 :Technology Commercialization **Unit1:Technology Assessment and Refinement**	**Block 3 :Technology Commercialization** **Unit1:Technology Assessment and Refinement** Meaning; Importance; Approaches and Methods of	No Change

Meaning; Importance; Approaches And Methods Of Assessment And Refinement Of Various Technologies – Stakeholder Oriented Approaches Including Participatory Technology Assessment And Refinement; Assessment And Refinement Of Traditional and Indigenous Knowledge And Grassroot Innovations **Unit 2 Technology Valuation** Returns to Investment; IP Valuation-Oxford Context, IP Valuation Methods – Cost Approach; Income Approach - Discounted Cash Flow, Risk-Adjusted Net Present Value, Net Present Value With Monte Carlo Simulation and Real Options Theory; Market Approach - Industry Standards Method, Rating/Ranking Method, Rules of Thumb Approach and Auction Method; Hybrid Approaches; Royalty Rate Method **Unit 3 Technology Commercialisation Strategies** Meaning- Approaches for Technology Commercialisation – Technology Scaling Up, Technology Licensing, Handholding, Agripreneur Development, Technology	Assessment and Refinement of Various Technologies – Stakeholder Oriented Approaches Including Participatory Technology Assessment and Refinement; Assessment and Refinement of Traditional and Indigenous Knowledge and Grassroot Innovations **Unit 2 Technology Valuation** Returns to Investment; IP Valuation-Oxford Context, IP Valuation Methods – Cost Approach; Income Approach - Discounted Cash Flow, Risk-Adjusted Net Present Value, Net Present Value with Monte Carlo Simulation and Real Options Theory; Market Approach - Industry Standards Method, Rating/Ranking Method, Rules of Thumb Approach and Auction Method; Hybrid Approaches; Royalty Rate Method **Unit 3: Scaling Up of Technologies** Meaning, Types and Stages of Technology Scaling Up; Mechanisms **Unit 4: Technology Licensing** Procedures of Licensing, Preparing Licensing Documents; Management of Technology Licensing Process **Unit 5 Technology Takers and Entrepreneurship** Meaning; Types of Technology Takers; Technology Taking as A Strategy; Types of Entrepreneurship – Agripreneurs, Startups, Small	No Change BSMA Unit 3 Merged with Block 1 Unit 3 BSMA Unit 4 No Change

Business Incubation **Unit 4: Scaling Up of Technologies** Meaning, Types and Stages of Technology Scaling Up; Mechanisms **Unit 5: Technology Licensing** Meaning and Types - Procedures of Licensing, Preparing Licensing Documents; Management of Technology Licensing Process **Unit 6 Technology Takers and Entrepreneurship** Meaning; Types of Technology Takers; Technology Taking As A Strategy; Types of Entrepreneurship – Agripreneurs, Startups, Small Businesses, Producer Organizations, Self Help Groups, Clusters and Other Forms of Entrepreneurship **Unit 7 Policy Support for Technology Commercialisation and Entrepreneurship Development** Policy Support for Entrepreneurship Development In India - National Policy on Skill Development and Entrepreneurship and Other Polices; Government of India Support For Innovation and Entrepreneurship – Startup India, Make In India, Digital India, Atal Innovation Mission And Others;	Businesses, Producer Organizations, Self Help Groups, Clusters and Other Forms of Entrepreneurship **Unit 6 Policy Support for Technology Commercialisation and Entrepreneurship Development** Policy Support for Entrepreneurship Development In India -National Policy on Skill Development and Entrepreneurship and Other Polices; Government of India Support For Innovation and Entrepreneurship – Startup India, Make In India, Digital India, Atal Innovation Mission And Others; Entrepreneurship Policy And Schemes At Different States Of India; Organisations Promoting Entrepreneurship In India	Rewording No Change No Change

Entrepreneurship Policy And Schemes At Different States Of India; Organisations Promoting Entrepreneurship In India		
Block 4: Technology Incubation **Unit 1 Basics of Technology Incubation** Meaning, Functions and Types; Stakeholder Oriented Incubation Process – Livelihood incubation, village Incubators **Unit 2 Technology Incubation in India** System of Technology Incubation- Incubation Process; Its Effectiveness; Managing Profit Oriented and Non-Profit Incubators; Schemes For Promoting Incubators In India	**Block 4: Technology Incubation** **Unit 1 Basics of Technology Incubation** Meaning, Functions and Types; Stakeholder Oriented Incubation Process – Livelihood Incubation, Village Incubators **Unit 2 Technology Incubation in India** Schemes for Promoting Incubators in India System of Technology Incubation- Incubation Process; Its Effectiveness; Managing Profit Oriented and Non-Profit Incubators.	No Change Modified in light of recent developments
Block 5: Technology Promotion and Essential Skills for Technology Commercialisation **Unit 1 Technology Promotion** Technology Promotion – Meaning, Types, Business Meetings, Scientist-Industry/ Entrepreneur Meets, Technology Conclave, Business Plan Competition, Farmers Fairs, Technology Shows **Unit 2 Dealing with Entrepreneurs, Agripreneurs and Other Stakeholders** Business Communication; Business Etiquette;	**Block 5: Technology Promotion and Essential Skills for Technology Commercialisation** **Unit 1 Technology Promotion** Technology Promotion – Meaning, Types, Business Meetings, Scientist-Industry/ Entrepreneur Meets, Technology Conclave, Business Plan Competition, Farmers Fairs, Technology Shows **Unit 2 Dealing with Entrepreneurs, Agripreneurs and Other Stakeholders** Business Communication; Business Etiquette; Business Networking	No Change

Business Networking		
Block 6: Emerging Approaches in Technology Commercialisation and Incubation **Unit 1 Technology Scouting** Technology Scouting and Innovations in Technology Incubation	**Block 6: Emerging Approaches in Technology Commercialisation and Incubation** **Unit 1 Technology Scouting** Technology Scouting and Innovations in Technology Incubation	No Change
PRACTICAL 1. Understanding the technology commercialisation process – Visit to Technology Commercialisation Unit of ICAR Institute/ Agricultural University 2. Understanding the IPR protection practices – Visit to Patent Attorney office 3. Hands-on experience in drafting IPR application – Patent/Copyright/ Trademark 4. Understanding protection of biological resources including plant varieties – Visit to PPVFRA Branch office/ ICAR Institute or Agricultural University involved in plant variety protection 5. Documenting Traditional and indigenous knowledge – Field experience in using various protocols of using traditional and indigenous knowledge 6. Protecting unique local goods through Geographical Indications – Hands on experiences	**PRACTICAL** 1. Understanding the technology commercialisation process – Visit to Technology Commercialisation Unit of ICAR Institute/ Agricultural University 2. Understanding the IPR protection practices – Visit to Patent Attorney office 3. Hands-on experience in drafting IPR application – Patent/Copyright/ Trademark 4. Understanding protection of biological resources including plant varieties – Visit to PPVFRA Branch office/ ICAR Institute or Agricultural University involved in plant variety protection 5. Documenting Traditional and indigenous knowledge – Field experience in using various protocols of using traditional and indigenous knowledge **6.** Technology Assessment/ Validation Of Traditional and Indigenous Knowledge – and Other Methods. Hands on Experience In Technology Valuation. **7.** Hands on Experience in Technology Licensing	Reworded, rearranged as per flow

in documenting and registering Geographical indications 7. Technology assessment/ validation of traditional and indigenous knowledge – QuIK and other methods 8. Hands on experience in technology valuation 9. Hands on experience in technology licensing process including drafting agreements 10. Understanding the Technology Business Incubation – Visit to Agri Business Incubator or Technology Business incubator 11. Hands on experience in planning and organising technology promotion events 12. Hands on experience in various techniques in business communication and Business etiquette	Process Including Drafting Agreements: ZTMU 8. Role Plays or Simulation Games in Various Techniques in Business Communication and Business Etiquette 9. Hands on Experience in Planning and Organising Technology Promotion Events 10. Understanding the Technology Business Incubation – Visit to Agri Business Incubator or Technology Business Incubator	

TEACHING METHODS/ACTIVITIES

- Lecture cum discussion
- Cases
- Class exercises
- Assignment (Reading/Writing)
- Student's Book/Publication Review
- Group Presentation

Resources

Bandopadhyay, D. 2018.Securing our natural wealth: A policy agenda for sustainable development in India and for its neighbouring countries. Singapore; Springer.

Ghosh, S, And Joshi A. 2017.Handbook for non-profit incubator managers. New Delhi: Deutsche Gesellschaftfür Internationale.

Gupta AK. 2016. Grassroots innovation: Minds on the margin are not marginal minds. Gurgaon: Penguin Books.

ICAR.2018. ICAR Guidelines for Intellectual Property Management and Technology Transfer/Commercialization (Revised In 2018). Indian Council of Agricultural Research, New Delhi

Pandey N and Dharni K. 2014. Intellectual Property Rights. Delhi. Phi Learning Pvt. Ltd.

Sharma G and Kumar H. 2018.Intellectual Property Rights and Informal Sector Innovations: Exploring grassroots innovations in India. *The Journal of World Intellectual Property*. 1-17. Doi: Https://Doi.Org/10.1111/Jwip.12097.

Singh Rashmi, Sharma J P, Nain M.S. (2014) Entrepreneurial Technical Information Packages (ETIPS), ICAR-IARI, New Delhi.

Singh Rashmi, Sharma J P, Nain M.S., Burman R Roy, Rao D U M. (2012). Entrepreneurship Development in Agriculture, Biotech Publishers New Delhi.

Stevens AJ. 2016. Intellectual Property Valuation Manual for Academic Institutions. (Report No. CDIP/17/Inf/4). Geneva: Committee on Development and Intellectual Property, (CDIP).

WIPO and ITC 2010. Exchanging Value – Negotiating Technology Licenses, A Training Manual. World Intellectual Property Organization (WIPO).