Course Title: Technology Commercialization and Incubation
Course Code: EXT -603
Credit Hours: 3(2+1)

Theory

Block 1: Technology Commercialisation and the Modern Context
Unit 1: 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 commercialisation

Unit 2: Nature of Agricultural Technology
- Agricultural technology – meaning, types;
- technology generation system; technology life cycle

Unit 3: Basics of Technology transfer and commercialisation
- Technology transfer Vs Commercialisation;
- Technology commercialisation process – elements, models, systems and processes;
- Technology transfer model – research, disclosure, development and commercialisation

Block 2: Intellectual Property Resources (Ipr) Management
Unit 1: 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.

Unit 2: Systems for Protecting IP
- IPR protection laws and systems – National IPR Policy; and IPR laws;
- procedures for filing IP protection;
- Systems of IP protection and management in agricultural universities and research institutions and also by stakeholders

Unit 3: Management of IPR
- Mechanisms of IPR Management – Institutional arrangement, IP Management processes – invention disclosure;
- IP portfolio management; Infringement management

Unit 4: 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 commercialising farmers varieties and other biological resources;
- National Biodiversity Authority, PPVFRA and other agencies involved in management of

biological resources in India. Access to Genetic Resources and Sharing of Benefits

Unit 5: Protection, Management and Commercialisation of Grassroot and Farmers Innovations, Traditional and Indigenous Knowledge

- Traditional and Indigenous Knowledge, Grassroot and Farmers Innovations – Meaning, forms and importance;
- Systems of documentation, registration, protection and commercialisation. 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 6: 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 commercialisation of GI protected materials and processes.

Unit 7: 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

Block 3: Technology Commercialisation

Unit 1: Technology Assessment and Refinement

- 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 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;
- 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 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

Block 6: Emerging Approaches in Technology Commercialisation and Incubation
Unit 1: Technology Scouting
Technology Scouting and Innovations in technology incubation

Practicals

- Understanding the technology commercialisation process – Visit to Technology Commercialisation Unit of ICAR Institute/ Agricultural University
- Understanding the IPR protection practices – Visit to Patent Attorney office
- Hands-on experience in drafting IPR application – Patent/Copyright/ Trademark
- Understanding protection of biological resources including plant varieties – Visit to PPVFRA Branch office/ ICAR Institute or Agricultural University involved in plant variety protection
- Documenting Traditional and indigenous knowledge – Field experience in using various

protocols of using traditional and indigenous knowledge
- Protecting unique local goods through Geographical Indications – Hands on experiences in documenting and registering Geographical indications
- Technology assessment/ validation of traditional and indigenous knowledge – QuIK and other methods
- Hands on experience in technology valuation
- Hands on experience in technology licensing process including drafting agreements
- Understanding the Technology Business Incubation – Visit to Agri Business Incubator or Technology Business incubator
- Hands on experience in planning and organising technology promotion events
- Hands on experience in various techniques in business communication and Business etiquette

Suggested Readings

- 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: DeutscheGesellschaftfür 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.
- 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).

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Course Title: Policy Engagement and Extension
Course Code: EXT -601
Credit Hours: 3 (2+1)

Theory

BLOCK1:Why Policies Matter?
Unit1: 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 influence defining organizational roles and performance in extension organizations-Role of policies in upscaling knowledge-Role of extension in influencing policies to enable innovation.

Unit2: Policy Advocacy andTools
- Definition of advocacy,
- Approachestopolicyadvocacy- Advising,Mediacampaigning,Lobbying,Activism,InformationEducationCommunication(IEC)andBehaviorChangeCommunication (BCC); Advocacy for Rural Advisory Services(RAS)
- Policy advocacy strategy

Unit3: 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 tools, policy influence tools

Unit4: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; stake holder mapping, identifying opportunities and barriers, mobilising financial resources;
- Dealing with policy in coherence :identifying contradictions and challenges in policy implementation

BLOCK2: Using Evidence to influence policy change
Unit 1: Influencing Policy Change
- Generating evidence: Role of policy research;
- Analyzing the usefulness and appropriateness of the evidence;
- Using evidence in policy advocacy;
- Understanding your audience: analyzing channels of influence; creating alliances; identifying policy champions;
- Defining goals and objectives;
- Developing advocacy messages: Policy papers, Policy briefs, good practice notes, etc.: Good practices in influencing policies

- Organising policy dialogues: Policy engagement strategy-Engaging with policy makers: GO and NGO experiences; Policy working groups; advisory panels;
- use of committees: Use of media including ICTs and social media for influencing policies.

Unit 2: 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.

Practicals
- Analysis of country/state level agricultural/extension policy to understand the policy intentions from strengthening EAS
- Analysis of extension policy of other countries: policy intentions, processes adopted in development of the policy and mechanisms of policy implementation
- Interview key policy actors in EAS arena at the state/national level (eg: Director of Agriculture, Director of Extension in SAU, Chairman/Managing Director of Commodity Board. Member Agriculture, State Planning Board) to explore policy level challenges in EAS
- 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
- Explore how different stakeholders influence policies (eg: policy advocacy of prominent NGOs, private sector and public sector) -What mechanisms and tools they use
- 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.

Suggested Readings
- AEPF. 2015. *Report on the Policy Forum by Ghana Directorate of Agricultural Extension Services,*Ministry of Food and Agriculture; Modernizing Extension and Advisory Services andvAgriculture Policy Support Project, Ghana.http://www.g-fras.org/en/knowledge/documents/category/18-policy.html?download=490:report-on-the-ghana-agricultural-extension-policy-forum-2015.
- Amosa, MDU. 2018. *Policy Analysis and Engagement Toolkit.* A guide for Pacific Non-governmentOrganizations in the Fisheries Sector. WWF. http://d2ouvy59p0dg6k.cloudfront.net/downloads/policy_analysis_toolkit_quality.pdfAnonymous.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 Effective ProblemSolving* Fourth Edition. Sage Publications. CQ Press.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 it Made?. Policy and Policymaking in the UK*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 Strengthening ExtensionPolicy Interface at MANAGE on 9-11th Nov, 2016 in collaboration with the CRISP & ICARATARI,Bangalore*.

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Course Title: Methodologies for social and Behavioural Sciences
Course Code: EXT -602
Credit Hours: 3 (2+1)

Theory

BLOCK1: Advanced methods for improving quality of research data
Unit1: Measurement Properties of Research Instruments

- Measurement properties– Dimensionality, reliability and validity;
- Dimensionality–Uni dimensionality and multi dimensionality, 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 – Judgesrating, Lawshe's Content Validity Ratio, Item-objective congruence index; latent variable method;
- Reliability-Internal consistency reliability–Split-Half, Cronbachalpha; Temporal Stability reliability-test-retest method; Inter rater Consistency and Consensus–inter rater reliability and inter rater agreement;
- Alternative Forms or parallel form sreliability – Reliability of difference - Factors Affecting the Validity and Reliability of Test Scores;
- GeneralizabilityTheory

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 behavioural 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, Indexex 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

Unit 2: Scales, Indexes and Tests-2

- Steps in constructing a multi-dimensional scale using confirmatory factor analysis,; Response scales - Guttman's scalogram analysis and The 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 3: Emerging Research Approaches and Designs
Unit 1: 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

Unit 2: Emerging Approaches

- Mixed methods research – meaning, purpose, types and applications;
- Participatory research – Meaning, importance, types, methods and tools and 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

Block 4: Utilising Research Outputs
Unit 1: 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 farmers technologies;
- Ethical practices in publishing; Plagiarism – meaning, sources, Identifying and correcting plagiarism in a research paper using anti-plagiarism software

<u>**Practicals**</u>

- 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

<u>**Suggested Readings**</u>

- 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:

AppletonCentury-Crofts.

- Furr, RM. 2011. Scale construction and psychometrics for social and personality psychology. Los Angeles: SAGE Pub.
- Malhotra, NK. 2010. Marketing research: An applied orientation. Sixth Edition. Upper SaddleRiver, 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
- 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
- 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. 6[th]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. http://www.aesanetwork.org/ wp-content/uploads/2018/07/6.pdf

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Course Title: Educational Technology and Instructional Design
Course Code: EXT -604
Credit Hours: 3 (2+1)

Theory

Block 1: Educational Technology
Unit 1: The Landscape of Educational Technology and Instructional Design
- Understanding various terms - educational technology, instructional design, instructional systems design, curriculum design, pedagogy, andragogy;
- Brief overview of the origin and evolution of ET and ID as theory and practice;
- what is the relevance of ET and ID relevant in extension and rural advisory services? Extensional professionals as instructional designers and architects of the learning experience

Unit 2: Theories of Learning What is learning?
- Critical overview of Behaviorism, Cognitivism, Constructivism and Complex learning theories; instructional designers and learning theories;
- Types of learning or learning domains- Bloom's taxonomy of the cognitive domain, Krathwohl and Bloom's affective domain and Simpson's psychomotor domain

Unit 3: Technology Enabled Learning
- What is the role of technology in education? Digital media, new tools and technology;
- Open and distance Learning (ODL);
- Online Education - Synchronous and Asynchronous learning models;
- eLearning, Massive Open Online Courses - SWAYAM, Open Education Resources (OERs), Course CERA, EduEx, CoL, RLOs; digital education and its applications in higher agricultural education;
- Smart classrooms and Campuses, Web-based remote laboratory (WBRL); Integrating media and digital tools into ID;
- types and implications of disruptive technologies for higher education and extension;
- Augmented learning; Adaptive learning; meaning, features and good practices in using open source Learning Management Systems (Moodle);
- Quality assurance and certification in e-learning.

Block 2: Instructional Design
Unit 1: Theories and Models of Instruction
- Howard Gardner's Theory of Multiple Intelligences, David Kolb's Experiential Learning Cycle, Albert Bandura's Social Learning Theory,
- Rand Spiro's Cognitive Flexibility Theory and Its Application In eLearning, Wlodkowski's Motivational Framework for Culturally Responsive Adult Learning;
- ADDIE Model, Dick and Carey Model, SAM Model, Bloom's Taxonomy;
- integrating the theories of instruction into the practice of ID in extension and RAS ecosystem.

Unit 2: Creating Instruction
- Overview of planning, designing and implementing the curricula and learning experiences;
- Needs Analysis - meaning, approaches and steps;
- Task and content analysis - meaning, approaches, steps and techniques (topic analysis, procedural analysis, and the critical incident method);
- Learner analysis – meaning, importance and approaches, relevance of Maslow's Hierarchy of Needs and learning styles, Captive Audience vs. Willing Volunteers, Universal vs. user-

centered design, Learner Analysis Procedures;

- Writing learning objectives: Meaning of Learning Goal and Learning Objectives; ABCDs of well-stated objectives;
- Setting goals, translating goals into objectives; Contextualising ADDIE process within the Extension learning environment

Unit 3: Instructional Strategies

- Organizing content and learning activities - scope and sequence of instruction;
- Posner's levels of organizing (Macro, Micro, Vertical, and Horizontal) and structures of organizing (content vs. media) instruction, Gagne's events of instruction, Edgar Dale's Cone of Experience;
- Methods of Delivery- classroom teaching, programmed instruction, synchronous and asynchronous modes of distance education;
- Changing role of a teacher in classroom and teaching competencies

Unit 4: Evaluating Instruction

- Meaning of Assessment, Measurement and Evaluation;
- Developing learner evaluations and their reliability & validity;
- assessment techniques for measuring change in knowledge, skill and attitude of learners - Objective Test Items, Constructed-Response Tests, Direct Testing, Performance Ratings, Observations and Anecdotal Records, Rubrics, Portfolios, Surveys and Questionnaires, Self-Reporting Inventories, Interviews;
- Conducting learner evaluation pre-, during and post-instruction; Formative and Summative Evaluation- meaning, approaches and steps;
- Evaluating Learner Achievement and the Instructional Design Process; Evaluating the success of instruction; Performance appraisal of teachers

Unit 5: Trends in Instructional Design

- Alternatives to ADDIE model - Rapid prototyping and constructivist ID, reflections on instructional design as science and as an art;
- Relating ID models and process in extension learning environment;
- political economy of higher education in developed and developing countries;
- University assessment and rating methods, returns from agricultural higher education; research in education and instructional design.

Practicals

- Exercises on preparation of the Analysis Report that includes the task/content analysis and learner analysis and the Design Plan includes learning objectives and corresponding instructional strategies and assessment items
- Prepare course outline and lesson plan with an appreciation for diverse learning styles based on temperament, gender, and cultural/ethnic differences and deliver a lecture for UG/PG students
- Assessing learning styles through Barsch and Kolb inventories
- Development and testing of survey instruments for evaluating learning outcomes/ competencies of students
- Development and testing of survey instruments for performance appraisal / competency assessment of teachers.
- Design an online e-learning module on a topic of interest as a capstone project - integrate and

apply the knowledge and skills gained from the course for creating an effective learning experience for a target audience

- Designing and developing a theme based knowledge portals
- Exercises on designing an online course using open source LMS like moodle or EdX
- Select and evaluate or design for social al media
- Prepare a short research paper on recent theories and models of instructional design
- Interview an instructional designer of your choice and prepare a synthesis report about what job roles he/she perform, What ID processes does he or she use, challenges faced
- Develop a prototype for one of the lessons in your design plan using PowerPoint or a website builder such as Weebly to create the screens integrating multimedia content and various functionalities
- Field visit to a virtual learning / augmented learning labs, e-learning labs, distance learning centres, etc.
- Hands-on practice with video-editing software, web conferencing and video conferencing solutions

Suggested Readings

- Agarwal JC. 2007. *Essentials of Educational Technology Innovations in Teaching – Learning.*2nd Ed. Vikas Publ. House.
- Allen M. 2013. *Leaving ADDIE for SAM: An Agile Model for Developing the Best Learning Experiences*https://www.alleninteractions.com/about
- Anglin GJ (Ed.), 1995. *Instructional technology: Past, present, and future.* Englewood, CO: Libraries Unlimited.
- Anonymous. 2000. *Contents Pages of the Journal Educational Technology* from January, 2OO0to December, 2O15 Volume 40-Volume 55http://publicationshare.com/pdfs/ET-Contents-Pages-2000-2015.PDF
- Bandura A. 1977. *Social learning theory.* Englewood's Cliffs, NJ: Prentice-Hall
- Bandura A. 2001. *Social cognitive theory: An agentic perspective.* Annual Review of Psychology,52, 1–26
- Britain S. 2004. *A Review of Learning Design: Concept, Specifications and Tools. A report forthe JISC E-learning Pedagogy Programme*, May 2004.
- Brown AH and Timothy DG. 2016. *The essentials of instructional design: connecting fundamentalprinciples with process and practice*, Third edition, Routledgehttps://ikhsanaira.files.wordpress.com/2016/05/the-essential-of-instructional-design.pdf
- Challa J and Reddy NM. 2008. *Education Technology for Agricultural Sciences,* NAARM,Rajendra Nagar, Hyderabad, Telangana, India.David HJ. 2003. *Learning to Solve Problems: An Instructional Design Guide*.
- Duffy TM and Cunningham DJ. 1996. *Constructivism: Implications for the design and deliveryof instruction.* In Jonassen D (Ed.), Handbook of Research for Educational Communicationsand Technology (pp. 170-198).
- New York: Simon & Schuster Macmillan Edward T. 2013.Power Point Is Evil.https://www.wired.com/2003/09/ppt2/
- Ellen R. 2004. *Instructional Design and Curriculum Development: Deconstructing the*

*Difference,*Educational Technology, Vol. 44, No. 2 (March-April 2004), pp. 3-12.https://www.jstor.org/stable/44428883

- Gardner H. 2008. *Multiple intelligences: New horizons in theory and practice*. New York, NY:Basic Books.
- Gayle VDS, Karen LR, Patrick RL. 2018. Web-Based Learning: Design, Implementation and Evaluation, 2nd Edition Hsu YC, Hung JL, and Ching YH. 2013. *Trends of educationaltechnology research: More than a decade of international research in six SSCI-indexedrefereed journals.* Educational Technology Research and Development, 61(4), 685-705.https://www.academia.edu/1141731/Aesthetic_principles_for_instructional_design.

- James ML. 2006. *Small Teaching: Everyday Lessons from the Science of Learning*
- Kolb D. 2014. *Experiential learning: Experience as the source of learning and development* (2nded.). Upper Saddle River, NJ: Prentice Hall
- Koper R. 2006. *Current Research in Learning Design*, Educational Technology & Society, 9 (1),13–22.

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Course Title: Risk Management and Climate change Adaptation
Course Code: EXT -605
Credit Hours: 3(2+1)

<u>Theory</u>

Block 1: Risk Management in Agriculture
Unit 1: Understanding Risk and Distress
- Introduction to risk, risk management, uncertainty, sensitivity and distress, General risk theory, Risk analysis methods,
- Risk perception and decision making, Indicators of risk and distress in agriculture – identification, selection and assessment,
- Understanding the agrarian distress in Indian agriculture, Sources of distress in Indian farming -changing farm size, land use, cropping patterns, pricing policy, markets and terms of trade,
- Typology of crisis in agriculture; Droughts, floods and Indian agriculture,
- Distress and farmer suicides - causes and socio-economic consequences

Unit 2: Managing Risk and Distress
- Ways to reducing/managing risk and distress in Indian agriculture;
- crop and life insurance;
- Developing support systems;
- Planning, implementation and evaluation of risk/distress management programs;
- Institutional frameworks for risk and disaster management - NDMA & SDMAs;
- Developing District Agriculture Contingency Plans;
- Risk management by diversification; Good practices and lessons from other countries;
- Responses of government, non-government and extension system to agrarian crisis; National Farmers Policy.

Unit 3: Extension Professionals and Risk management
- Understanding social-psychological and behavioural dimensions of farmers under risk/distress;
- Risk perception and communication;
- Helping farmers manage farm level risks - mobilising resources, linking with markets, strengthening capacities;
- Working with village level risk management committees;
- Operational skills for preparing contingency and disaster management plans;
- Institutional and extension innovations in managing risk and distress; Policy and technological preferences for dealing with drought and flood.

Block 2: Adapting to Climate Change
Unit 1: Introduction to Climate Change
- Science Basic concepts of and terms in climate change science;
- impacts of climate change;
- anthropogenic drivers of climate change,
- Climate change and Indian agriculture; climate adaptation vs. disaster risk reduction;
- anticipated costs of adaptation; climate change and poor;
- Overview of UNFCCC framework and institutions, Kyoto Protocol and beyond;

- India's National Action Plan on Climate Change and National Mission on Strategic Knowledge on Climate Change;
- National Coastal Mission, Institutional arrangements for managing climate change agenda.

Unit 2: Introduction to Climate Change

- Adaptation and Mitigation Introduction to Climate Change Adaptation, Conducting a vulnerability assessment (CVI and SEVI frameworks), Identifying and selecting adaptation options;
- Global, national and state level initiatives and plans to support climate change adaptation, private sector and civil society initiatives and activities;
- Mainstreaming climate change adaptation into development planning, Financing climate adaptation and budgetary allocations for programmes, Gender and climate change adaptation,
- Agricultural development programmes and strategies towards climate change adaptation and mitigation, Community based and Ecosystem based adaptation strategies, preparing evidence based intervention plans for vulnerability reduction at micro and macro-levels.

Unit3: Climate Smart Agriculture (CSA) and Extension &Advisory Services

- Climate smart agriculture;
- Developing climate smart and climate resilient villages;
- Stakeholders and determinants involved in climate smart agriculture;
- Climate smart agriculture and EAS;
- Innovative extension approaches used in CSA;
- Climate information services, Farmers perceptions about climate change;
- Farm and household level manifestations and adaptation strategies;
- Barriers and limits to adaptation;
- Farmers feedback on performance of extension methods;
- Skills, competencies and tools required for extension professionals at different levels and development departments in up scaling CSA.

Practicals

- Hands-on practice in using risk assessment/analysis tools
- Case studies on risk / distress assessment in agriculture -Indian and global
- Lessons / Experiences from NICRA Project in agriculture and allied sectors
- Developing criteria, indicators and indices for assessment of risk, vulnerability and resilience
- Hands on practice on use of vulnerability and risk assessment tools and techniques
- Case studies on success stories of climate change adaptation and community based initiatives
- Developing district and village level intervention plans for climate change adaptation
- Field Visits to State Disaster Management Authority
- Case studies on climate smart agriculture / villages from India and world
- Case studies on impact assessment of crop insurance programs, disaster management programs
- Capstone project on documenting ITKs and local practices related to reducing risk / climate resilience agriculture

Suggested Readings

- Ahamad, J and Alam D. 2012. *Impact of Climate Change on Agriculture and Food Security inIndia.* Int. Jr. of Agril., Env. and Biotech. Vol. 4, No. 2: June 2011: 129-137
- Baquet A, Hambleton R, and Jose D.1997. *Introduction to Risk Management. UnderstandingAgriculture Risk: Production, Marketing, Financial, Legal, Human Resources*. RiskManagement Agency, USDA. December 1997http://extensionrme.org/pubs/introductiontoriskmanagement.pdf
- Becker P.2014. *Sustainability Science: Managing Risk and Resilience for SustainableDevelopment.* Amsterdam and Oxford: Elsevier.
- Burton ES and Riikka R. 2010. *Strengthening Agricultural Extension and Advisory Systems.*The International Bank for Reconstruction and Development/The World Bank.http://siteresources.worldbank.org/INTARD/Resources/Stren_combined_web.pdf
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- Davis K and Sulaiman RV. 2013. *Extension Services for Effective Agricultural Risk Management*.CRISP . Washington, DC: FARMD.
- Deepika B, Saravanan R, and Suchiradipta B. 2018. *Climate Smart Agriculture towards TripleWin: Adaptation, Mitigation and Food Security.* Research Report Brief 5, CAEIRA,MANAGE, Hyderabad, India.http://www.manage.gov.in/publications/reportbrief/MANAGE_Research%20Brief__5 Deepa.pdf
- GFRAS. n.d. *RAS, the engine for farmer productivity.* Global Forum for Rural Advisory Serviceshttp://www.g-fras.org/es/105-english/gfras/events/3rd-gfras-annaul-meeting/158-ras-theengine-for-farmer-productivity.html
- GFRAS. 2012. *Module 13: Risk Mitigation and Adaptation in Extension and Advisory.* GlobalForum for Rural Advisory Services. file:///C:/Users/admin/Downloads/GFRAS_NELK_Module13_Risk_Mitigation-Manual%20(1).pdf
- GIZ. 2015. *The Role of the Private Sector to Scale Up Climate Finance in India.* Final ReportFinancing climate adaptation -https://www.giz.de/de/downloads/giz2015-en-nama-india-private-financial-institutionsclimate-finance-final-report.pdf

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Course Title: Facilitation for people centric Development
Course Code: EXT -607
Credit Hours: 3(2+1)

Theory
Block 1: Introduction to Facilitation for Development

Unit 1: Facilitation for development in the AIS Facilitation for development in the AIS;

- Understanding facilitation for development;
- Importance of facilitation as a core function of extension within the Agricultural Innovation Systems (AIS)

Unit 2: Principles, Attributes and Skills for Facilitation for Development

- Basic principles of facilitation for development;
- Desired attributes of facilitator for development- Cognitive attributes, Emotional attributes (Emotional intelligence), Social, behavioural and attitudinal attributes;
- Technical skills of a facilitator for development- Design processes, Facilitation techniques and tools, the art of questioning and probing, Process observation and documentation, Visualisation

Block 2: Facilitating Change in Individuals, Groups and Organisations

Unit 1: Realise Potential- Self-Discovery

- Self-discovery to realise our potentials, Tools for self-discovery,
- formulating a personal vision, Taking responsibility for your own development

Unit 2: Group Dynamics and Working Together

- Understanding the dynamics of human interaction, Group dynamics and power relations,
- Managing relationships, Shared vision and collective action, Tools for team building

Unit 3: Organizational Change Process

- Organizational change process, Organizational learning to adapt to changing environments,
- Enhancing performance of organizations, Leadership development, Tools for organizational change

Block 3: Facilitating Operational Level Multi-stakeholder Engagements

Unit 1: Multi-Stakeholder Interactions

- Defining stakeholders, Development of collective and shared goals, Building trust and accountability,
- Tools for stakeholder identification and visioning

Unit 2: Innovation and Policy engagement Platforms

- Visualising innovation platforms (IPs), Why are IPs important?,
- Different models of IPs for multi-stakeholder engagement, policy engagement platforms,
- Generating issues and evidence for policy action, Advocacy for responsive policy processes

Block 4: Brokering Strategic Partnerships, Networking And Facilitation

Unit 1: Linkages, Partnerships, Alliances and Networking

- Brokering linkages and strategic partnerships, Identification of critical links, Knowledge

brokering,
- Creating linkages with markets, Learning alliances and networking, Coordination of pluralistic service provision within the AIS,
- The concept of action learning and reflective practitioners, Networking

Unit 2: Facilitating Capacity Development

- Facilitating Capacity Development-Facilitate participation and learning in development programs and projects.
- Virtual platforms- skills for strengthening dialogue, collaboration, shared commitment amongst diverse actors and stakeholders

Practicals

- Practicing facilitation techniques,
- Self discovery exercises,
- Working together and interaction (task based),
- Arrangement for multi-stakeholder interactions,
- Understanding organisational change process tools and techniques,
- Case analysis on organisational change process,
- Participating with innovation platforms,
- Policy engagement platforms,
- Stakeholder analysis mapping,
- Exercise on networking skills,
- Facilitating capacity building programmes
- Facilitating virtual platforms
- Filed visit to multi-stakeholder partnership projects

Suggested Readings

- Anonymous. *Seeds for Change. Facilitation Tools for Meetings and Workshops.* Available https://seedsforchange.org.uk/tools.pdf
- Clarke S, Blackman R and Carter I. 2004. *Facilitation skills workbook -Training material for people facilitating small group discussions and activities using PILLARS Guides.* Tearfund, England.https://www.tearfund.org/~/media/files/tilz/fac_skills_english/facilitation__e.pdf
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- Jost C, Alvarez S and Schuetz T. 2014. *CCAFS Theory of Change Facilitation Guide.* CGIARResearch Program on Climate Change, Agriculture and Food Security.https://cgspace.cgiar.org/bitstream/handle/10568/41674/CCAFS%20TOC%20facili tation% 202014% 20FINAL.pdf

- Kennon N., Howden P. and Hartley M. 2002. *Who really matters? A stakeholder analysis tool.*Extension Farming Systems Journal: 5 (2).https://www.csu.edu.au/__data/assets/pdf_file/0018/109602/EFS_Journal_vol_5_no_2_ 02_ Kennon_et_al.pdf
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- Krick T, Forstater M, Monaghan P, Sillanpaa M. 2005. *The Stakeholder Engagement Manual:Volume 2, the Practitioner's Handbook on Stakeholder Engagement.* Accountability, UnitedNations Environment Programme, Stakeholder Research Associates Canada Inc.
- Linden J. 2015. *Innovation in Layer Housing: From Drawing Board to Reality.*http://www.thepoultrysite.com/articles/3494/innovation-in-layer-housing-from-drawingboard-to-reality/

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