Draft Guidelines for Designing Post-Graduate General Programs of Kerala (as per the decision of the Committee for Restructuring Post Graduate Curriculum in State Universities/ Colleges held on 30-08-2019 at Mahatma Gandhi University, Kottayam)

The University Grants Commission (UGC) has stressed speedy and substantive academic and administrative reforms in higher education for promotion of quality and excellence. The Action Plan proposed by UGC outlines the need to consider and adopt Semester System, Choice Based Credit System (CBCS), and Flexibility in Curriculum Development and Examination Reforms in terms of adopting Continuous Evaluation Pattern by reducing the weightage on the semester-end examination so that students enjoy a de-stressed learning environment. Further, UGC expects that institutions of higher learning draw a roadmap in a time-bound manner to accomplish the above.

All Institutions (Universities, Autonomous Colleges, and Non-autonomous Colleges) Need to be accredited by National Assessment and Accreditation Council (NAAC). NAAC Accreditation requires that all higher education institutions identify their own Program Outcomes. Unlike professional programs, the accreditation agency does not formally identify the Program Outcomes of General Programs. However, all organizations across the world associated with higher education identified very similar Program Outcomes. An indicative list of POs for general undergraduate programs is given in the Annexure 1. They may vary in their number and wording in an institution.

Suggested common Program Outcomes for PG programs in Kerala

PO1. Demonstrate a degree of mastery, at a level higher than the requirements in the appropriate bachelor program, over the area of the specialization of the program.

PO2. Carry out research independently and/or jointly in disciplinary or interdisciplinary areas

PO3. Write and present a substantial report/document on issues or problems of concern to the program

PO4. Demonstrate the ability to engage in independent and life-long learning in the broadest context of socio-technological changes.

To these Program Outcomes (POs) every PG Program will add up to two additional POs representing its Core activities (core courses and projects).

Graduates of any present-day post-graduate program require advanced knowledge in a discipline, adequate skills and knowledge of computing and data-based decision making, and ability to work on multi/inter-disciplinary problems. These can be attained in a PG program through five curricular components as

- Disciplinary Core
- Computing Hard Core
- Multi/Inter Disciplinary Soft Core
- Electives
- Project

As students at post-graduate level are required to engage with the subject knowledge more intensely and at higher cognitive levels, the number of credits per semester should be less than the per semester credit load of undergraduate students. UGC requires the undergraduate programs have minimum 120 credits in a 3-year program. In view of this an average credit load of about 18 credits per semester is suggested for PG programs. This should lead to 70 – 75 credits for a PG program.

The suggested credit distribution is

Disciplinary Core	33
Computing Hard Core	8
Multi/Inter Disciplinary Soft	6

Core	
Electives	15
Projects	10
Total	72

The disciplinary core courses of a program should be offered at level above the undergraduate courses.

The Computing Hard Core Courses can be

Modelling and Simulation	3:0:1
Data-based Decision Making	3:0:1

A multidisciplinary approach involves drawing appropriately from multiple disciplines to redefine problems outside of normal boundaries and reach solutions based on a new understanding of complex situations. Multidisciplinarity draws on knowledge from different disciplines but stays within their boundaries. For a person to effectively work in a multidisciplinary environment he/she needs to experience another discipline through some of its key issues. Some multidisciplinary courses that qualify for soft-core are

- Some Key Issues of Physics
- Some Key Issues of Chemistry
- Some Key Issues of Biology
- Some Key Issues of Sociology
- Some Key Issues of Economics
- Some Key Issues of Material Science
- Some Key Issues of Engineering
- Some Key Issues of Technology

However, if these courses to serve their intended purpose, they need to be designed by teams of specialists.

Interdisciplinarity analyzes, synthesizes and harmonizes links between disciplines into a coordinated and coherent whole (Annexure 2). It

normally emphasizes process and meaning by combining contents, theories, methodologies and perspectives from two or more disciplines. Some interdisciplinary courses that qualify for soft-core are

Water	Clothing	Terrorism
Earth	Health	Knowledge
Energy	Development	Complexity
Air	Women and Development	Governance
Food	Communications	Justice
Shelter		

Electives are chosen by the student from among a list of courses offered by the Department. Students may also be encouraged if they wish to credit courses offered by other Departments.

The projects can be more than one. For example, a 3-credit project in 2nd semester can be followed by 6-credit in the fourth semester.

The distribution of the courses over the four semesters of the PG program can be

Type	Credits	Credits			
		Sem1	Sem 2	Sem 3	Sem 4
Core Courses	33	15	9	6	3
Computing Hard Core	8	4		4	
M/I Courses	6		3		3
Electives	15		3	9	3
Projects	10		3		7
Credits	72	19	18	19	16

All PG programs are offered in four semesters. A semester may consist of 20 weeks of activities. The number of teaching weeks shall be 15-16 weeks.

Credit is defined by UGC as (Annexure 3)

- One classroom session per week over a semester.

- One hour of tutorial per week over a semester
- Two hours or more per week of laboratory or field work.

The content of the course and is scope should be designed to strictly fit into the number of credits chosen for the course.

UGC expects the Institutions to reduce the weightage to the semester-end examination (SEE), and increase the weightage to the continuous internal assessment (CIA). The weightage distribution between CIE and SEE may be chosen as 40:60 or 50:50. This weightage distribution will give opportunities to the teachers to plan for a wide range of assessments based on the requirements of the courses.

Annexure 1

Program Outcomes for General Undergraduate Programs

(Suggested): Students of all undergraduate general degree programs at the time of graduation will be able to

PO1. **Critical Thinking**: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.

PO2. **Effective Communication**: Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.

PO3. **Social Interaction**: Elicit views of others, mediate disagreements and help reach conclusions in group settings.

PO4. **Effective Citizenship**: Demonstrate empathetic social concern and equity centred national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.

PO5. **Ethics**: Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.

PO6. **Environment and Sustainability**: Understand the issues of environmental contexts and sustainable development.

PO7. **Self-directed and Life-long Learning**: Acquire the ability to engage in independent and life-long learning in the broadest context socio-technological changes

PO8. **Problem Solving**: Identify and formulate problems, and integrate resources to reach decisions, make recommendations or implement action plans.

PO9. **Computational Thinking**: Understand data-based reasoning through translation of data into abstract concepts using computing technology based tools.

PO10. **Global Perspective**: Understand the economic, social and ecological connections that link the world's nations and people.

Annexure 2

Interdisciplinary Courses

While conventional ideals of higher education have always been "critical and creative reflection and discourse," it becomes necessary to restate the objectives of higher education programs from time to time. For example, the American Association of Higher Education identifies the attributes of graduates all higher education programs as

- Effective communication
- Self-directed and life-long learning
- Ethical reasoning
- Individual, communities, and cultures
- Service community
- Influence of mind, body, and spirit on health
- Critical thought and knowledge acquisition
- Competence in one's discipline

These outcomes cannot be achieved through the present disciplinary approach to higher education programs, though it served very well for several decades. Many higher education programs included some basic courses from several disciplines to meet the changing needs of society. In such an approach, the relationship between the disciplines is merely one of proximity without any integration among them. The goals of higher education as stated by different academic bodies require inclusion of interdisciplinary courses at early stages of undergraduate programs.

Interdisciplinarity: Klein and Newell (1997) define Interdisciplinary studies as a process of answering a question, solving a problem, or addressing a topic that is too broad or complex to be dealt with adequately by a single discipline or profession and draws on disciplinary perspectives and integrates their insights to produce a more comprehensive perspective. The National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine of USA define interdisciplinary work as a mode of research by teams or

individuals that integrates information, data, techniques, tools, perspectives, concepts, and/or theories from two or more disciplines or bodies of specialized knowledge to advance fundamental understanding or to solve problems whose solutions are beyond the scope of a single discipline or area of research practice (National Academies, 2005, p. 39).

Students demonstrate interdisciplinary understanding only when they **integrate** knowledge and modes of thinking from two or more disciplines (Boix Manislla and Gardner, 2003). The disciplines, though necessary and foundational to interdisciplinary work, are not the sole or primary focus of the interdisciplinarity's attention; the focus is the complex problem or intellectual question that is being addressed. The disciplines simply serve as means to that end.

The four core elements of interdisciplinarity are:

- addressing complex problems and focus questions
- drawing on the disciplines
- integrating insights
- producing a new understanding of the problem

Proposal: NIAS, along with several other institutions in Bangalore undertake to develop interdisciplinary courses that can be offered in all undergraduate programs. Such courses should be designed, to ensure widespread adaptation, in the framework of semester duration and university type of examinations. The information and communication technologies available can be fully taken advantage of in achieving the objectives of such courses. Interdisciplinary courses should be based on objects and themes that students at undergraduate level can readily relate to. Some themes for such course are

Water	Health	Terrorism
Earth	Development	Thinking
Energy	Women and Health	Knowledge
Air	Women and Development	Computing

Space	Justice	Environment
Money	Humans	Population
Food	Evolution	Complexity
Clothing	Communications	Governance
Shelter	Collapse	Institutions

Theme based courses can be situated locally or globally. Globally situated courses can focus on the local impact of changes happening at a distance (new technologies, wars, terrorism, infectious diseases, etc.). Locally situated courses enable the student to understand the local and immediate issues. As it is important to have local and global perspectives of issues in today's strongly interconnected and interdependent world, students should be encouraged to take both types of courses. Each one of these themes is vast, and several courses can be designed with different focus questions and situating them differently.

Annexure 3

Definitions

Course: Every course offered can have three components associated with the teaching-learning process of the course, namely (i) Lecture – L (ii) Tutorial- T (iii) Practicals - P, where L stands for Number of Lecture Sessions per week, T stands for number of Tutorial Sessions per week consisting participatory discussion / self-study/ desk work/ brief seminar presentations by students and such methods that require active engagement of students with the concerned knowledge/ skills, and P stands number of Practice Sessions per week consisting of Hands on experience / Laboratory Experiments / Field Studies

In terms of credits, every one-hour (55 minutes) session/week over a semester of L amounts to 1 credit per semester, every one-hour (55 minutes) session/week over a semester of T amounts to 1 credit per semester, and a minimum of two-hour session/week over a semester of P amounts to 1 credit. The total duration of a semester is 20 weeks inclusive of semester-end examination. The number of teaching-learning weeks will be 16 per semester.

A course shall have one or more components (L, T and P). That means a course may have only lecture component, or only practical component or combination of any two or all the three components.

The total credits earned by a student at the end of the semester upon successfully completing the course are L + T + P. The credit pattern of the course is indicated as L: T: P.

If a course is of 4 credits then the different credit distribution patterns in L : T :P format could be 4:0:0, 1:2:1, 1:1:2, 1:0:3, 1:3:0, 2:1:1, 2: 2:0, 2:0:2, 3:1:0, 3:0:1, 0:2:2, 0:4:0, 0:0:4, 0:1:3, 0:3:1.

The concerned BoS will choose the convenient credit pattern for every course based on the requirement. However, generally, a course shall be of 3 or 4 credits.

Different courses of study are labelled and defined as follows:

Core Course: A course which should compulsorily be studied by a candidate as a core requirement is termed as a Core course.

A Core course may be a Soft Core if there is a choice or an option for the candidate to choose a course from a pool of courses from the main discipline