



**RAMAKRISHNA MISSION**  
**VIVEKANANDA CENTENARY COLLEGE**  
P.O. RAHARA, KOLKATA-700118  
WEST BENGAL, INDIA

**1.1.3 Report of all departments**

Botany	10 pages
Chemistry	7 pages
Physics	4 pages
Mathematics	35 pages
Microbiology	5 pages
Zoology	11 pages
Computer Science	3 pages

Programme Code		UGBOT				
Programme Name		BSc. Botany Honours				
Sl. No.	Course code	Title of the course	Employability	Entrepreneurship	Skill Development	Remarks
1	UGBOTCC01	Phycology and Microbiology	✓	✓	✓	EM - Apply the economic and medicinal aspects of algae & bacteriology. EN - Apply knowledge on instrumentation to start up diagnostic lab and algal culture in microbiology & phycology respectively. SD - Acquire skills in teaching, pathological & laboratory techniques.
2	UGBOTCC02	Biomolecules and Cell Biology	✓	✓	✓	EM - Understand and apply the concepts of central dogma & its regulation. EN - Apply various knowledge on Molecular biology techniques to set a start up biotech farm. SD - Analyse and apply cell and molecular biology techniques.
3	UGBOTCC03	Mycology and Phytopathology	✓	✓	✓	EM - Remember, explain and analyse the plant disease, their diagnosis, and control measure. EN - Apply the knowledge gained on fungal pathogen and plant disease in agricultural startup initiatives SD - Explain and apply the knowledge on mechanisms of pathogenic infection and disease management.
4	UGBOTCC04	Archegoniate			✓	Gives idea of Skill Development
5	UGBOTCC05	Anatomy of Angiosperms	✓		✓	EM - Apply the methods of plant identification and their medicinal importance. SD - Acquire skills in teaching of angiosperm diversity and plant reproduction.



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Sl. No.	Course code	Title of the course	Employability	Entrepreneurship	Skill Development	Remarks
6	UGBOTCC06	Economic Botany	✓	✓	✓	EM - Apply the economic and medicinal aspects of algae & bacteriology. EN - Apply knowledge on instrumentation to start up diagnostic lab and algal culture in microbiology & phycology respectively. SD - Acquire skills in teaching, pathological & laboratory techniques.
7	UGBOTCC07	Genetics	✓	✓	✓	EM - Demonstrate and apply the knowledge of plant tissue culture techniques and genetic engineering. EN - Apply the knowledge of tissue culture & RDT to start outsourcing services. SD - Demonstrate, and apply the concept of genetic engineering and plant tissue culture.
8	UGBOTCC08	Molecular Biology	✓	✓	✓	EM - Understand and apply the concepts of central dogma & its regulation. EN - Apply knowledge on Molecular biology techniques to set a start up biotech farm. SD - Hands on training in cell and molecular biology techniques.
9	UGBOTCC09	Plant Ecology and Phytogeography	✓		✓	EM - Apply and formulate knowledge gained in ecosystem management & pollution control. SD - Demonstrate, analyse and design models in pollution control, and sustainable development.
10	UGBOTCC10	Plant Systematics	✓		✓	SD - Demonstrate the molecular aspects of plant development. EM - Apply and formulate knowledge gained in ecosystem of plant.
11	UGBOTCC11	Reproductive Biology of Angiosperms	✓	✓	✓	EM - Demonstrate and apply the knowledge of genes and genomes to solve biological problems. EN - Apply the knowledge of genetics & genomics to startup consultancy services. SD - Demonstrate, analyse and apply the concept of modern genetic analysis.
12	UGBOTCC12	Plant Physiology	✓		✓	SD - Demonstrate the molecular aspects of plant development. EM - Apply and formulate knowledge gained in ecosystem of plant.



Sl. No.	Course code	Title of the course	Employability	Entrepreneurship	Skill Development	Remarks
13	UGBOTCC13	Plant Metabolism	✓		✓	SD - Demonstrate the molecular aspects of plant development. EM - Apply and formulate knowledge gained in ecosystem of plant.
14	UGBOTCC14	Plant Biotechnology	✓	✓	✓	EM - Demonstrate and apply the knowledge of plant tissue culture techniques and genetic engineering. EN - Apply the knowledge of tissue culture & RDT to start outsourcing services. SD - Demonstrate, and apply the concept of genetic engineering and plant tissue culture.
15	UGBOTDSE01	Industrial and Environmental Microbiology	✓	✓	✓	EM - Apply the beneficial and pathological aspects of bacteria & algae. EN - Apply hands on knowledge to initiate diagnostic lab and algal culture. SD - Acquire skills in teaching, pathological & laboratory techniques.
16	UGBOTDSE02	Plant Breeding	✓	✓	✓	EM - Demonstrate and apply plant tissue culture techniques and genetic engineering. EN - Apply the knowledge of tissue culture & RDT to start outsourcing services. SD - Demonstrate, and apply the concept of genetic engineering and plant tissue culture.
17	UGBOTDSE03	Biostatistics	✓	✓	✓	EM - Analyse and apply the descriptive statistics and develop skills in bioinstrumentation. EN - Apply knowledge on biological instrumentation to start up outsourcing facilities in various sectors. SD - Apply various sampling techniques and statistical inference to solve various problems.

  
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Sl. No.	Course code	Title of the course	Employability	Entrepreneurship	Skill Development	Remarks
18	UGBOTDSE04	Applied Phycology	✓	✓	✓	EM - Apply the economic and medicinal aspects of algae & bacteriology. EN - Apply knowledge on instrumentation to start up diagnostic lab and algal culture in microbiology & phycology respectively. SD - Acquire skills in teaching, pathological & laboratory techniques.
19	UGBOTDSE05	Research Methodology	✓		✓	EM - Understand and apply the knowledge of biological research and bioinstrumentation. SD - Hands on training in handling bioinstruments.
20	UGBOTSEC01	Value Education and Indian Culture	✓		✓	EM - Define, understand and apply the daily routine, self-evaluation & Integral Personality Development SD - Demonstrate and practice the Four Yogas
21	UGBOTSEC02	Online Course (In collaboration with IIT Bombay)	✓	✓	✓	Gives idea of Employability, Entrepreneur and Skill Development
22	UGBOTGE01	Cryptogamic Botany	✓		✓	EM - Apply and formulate knowledge gained in ecosystem management & pollution control. SD - Demonstrate, analyse and design models in pollution control, and sustainable development.
23	UGBOTGE02	Biology of Vascular Plants	✓		✓	SD - Demonstrate the molecular aspects of plant development. EM - Apply and formulate knowledge gained in ecosystem of plant.
24	UGBOTGE03	Plant Ecology, Anatomy and Embryology	✓	✓	✓	EM - Demonstrate and apply the knowledge of plant tissue culture techniques and genetic engineering. EN - Apply the knowledge of tissue culture & RDT to start outsourcing services. SD - Demonstrate, and apply the concept of genetic engineering and plant tissue culture.

Sl. No.	Course code	Title of the course	Employability	Entrepreneurship	Skill Development	Remarks
25	UGBOTGE04	Plant Physiology and Biotechnology	✓	✓	✓	EM - Understand, apply and discuss the metabolic pathways operative in plant cells. EN - Apply various knowledge on instrumentation to a start up plant bioactive compound synthesis. SD - Demonstrate, evaluate and analyse the different plant metabolic pathways

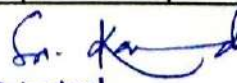
  
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<b>Program me Code</b>	PGBOT
<b>Program me Name</b>	M. Sc. Botany

EM: Employability; EN:  
Entrepreneurship; SD: Skill  
Development

Sl. No.	Course Code	Title of the course	Employ ability	Entrepr neursh ip	Skill Develop ment	Remarks
1	PGBOTCC1.1 (Th)	Phycology + Microbiology	✓	✓	✓	EM - Apply the economic and medicinal aspects of algae & bacteriology. EN - Apply knowledge on instrumentation to start up diagnostic lab and algal culture in microbiology & phycology respectively. SD - Acquire skills in teaching, pathological & laboratory techniques.
2	PGBOTCC1.2 (Th)	Mycology + Plant Pathology	✓	✓	✓	EM - Remember, explain and analyse the plant disease, their diagnosis, and control measure. EN - Apply the knowledge gained on fungal pathogen and plant disease in agricultural startup initiatives SD - Explain and apply the knowledge on mechanisms of pathogenic infection and disease management.
3	PGBOTCC1.3 (Th)	Biostatistics + Biophysics	✓	✓	✓	EM - Analyse and apply the descriptive statistics and develop skills in bioinstrumentation. EN- Apply knowledge on biological instrumentation to start up outsourcing facilities in various sectors. SD - Apply various sampling techniques and statistical inference to solve various problems.
4	PGBOTCC1.4 (Th)	Ecology + Evolution	✓		✓	EM - Apply and formulate knowledge gained in ecosystem management & pollution control. SD - Demonstrate, analyse and design models in pollution contro, and sustainable development.

  
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Sl. No.	Course Code	Title of the course	Employ ability	Entrepreneurship	Skill Development	Remarks
5	PGBOTCC1.5 (Pr)	Phycology + Microbiology	✓	✓	✓	EM - Apply the beneficial and pathological aspects of bacteria & algae. EN - Apply hands on knowledge to initiate diagnostic lab and algal culture. SD - Acquire skills in teaching, pathological & laboratory techniques.
6	PGBOTCC1.6 (Pr)	Mycology + Plant Pathology	✓	✓	✓	EM - Analyse plant disease, their diagnosis, and control measure. EN - Apply the knowledge gained in control of fungal pathogen and plant disease management services. SD - Explain and apply the knowledge on mechanisms of pathogenic infection and plant disease management.
7	PGBOTCC2.1 (Th)	Plant Anatomy + Developmental Biology			✓	SD - Demonstrate the molecular aspects of plant development.
8	PGBOTCC2.2 (Th)	Taxonomy of Angiosperms + Embryology of Seed Plants	✓		✓	EM - Apply the methods of plant identification and their medicinal importance. SD - Acquire skills in teaching of angiosperm diversity and plant reproduction.
9	PGBOTCC2.3 (Th)	Biochemistry & Metabolism + Plant Physiology	✓	✓	✓	EM - Understand, apply and discuss the metabolic pathways operative in plant cells. EN - Apply various knowledge on instrumentation to a start up plant bioactive compound synthesis. SD - Demonstrate, evaluate and analyse the different plant metabolic pathways
10	PGBOTCC2.4 (Th)	Environmental Science + System Biology	✓	✓	✓	EM - Apply and formulate knowledge gained in environment management & pollution control. EN - Apply the knowledge gained to start up consultancy services. SD - Demonstrate, analyse and design models in pollution control, and sustainable development.



Sl. No.	Course Code	Title of the course	Employability	Entrepreneurship	Skill Development	Remarks
11	PGBOTCC2.5 (Pr)	Taxonomy + Plant Anatomy			✓	SD - Demonstrate identification of plants and analyse structural plant anatomy.
12	PGBOTCC2.6 (Pr)	Biochemistry + Plant Physiology	✓	✓	✓	EM - Demonstrate and apply the knowledge of various metabolic pathways operative in plant cells. EN - Apply various knowledge on instrumentation to a start up plant bioactive compound synthesis. SD - Demonstrate, evaluate and analyse the different plant metabolic pathways
13	PGBOTCC3.1 (Th)	Cell & Molecular Biology	✓	✓	✓	EM - Understand and apply the concepts of central dogma & its regulation. EN - Apply various knowledge on Molecular biology techniques to set a start up biotech farm. SD - Analyse and apply cell and molecular biology techniques.
14	PGBOTCC3.2 (Th)	Genetics & Genomics	✓	✓	✓	EM - Demonstrate and apply the knowledge of genes and genomes to solve biological problems. EN - Apply the knowledge of genetics & genomics to startup consultancy services. SD - Demonstrate, analyse and apply the concept of modern genetic analysis.
15	PGBOTCC3.3 (Th)	Plant Biotechnology & Recombinant DNA technology	✓	✓	✓	EM - Demonstrate and apply the knowledge of plant tissue culture techniques and genetic engineering. EN - Apply the knowledge of tissue culture & RDT to start outsourcing services. SD - Demonstrate, and apply the concept of genetic engineering and plant tissue culture.
16	PGBOTCC3.4 (Th)	Allied Elective			✓	SD - Hands-on-technique.
17	PGBOTCC3.5 (Pr)	Plant Biotechnology	✓	✓	✓	EM - Demonstrate and apply plant tissue culture techniques and genetic engineering. EN - Apply the knowledge of tissue culture & RDT to start outsourcing services. SD - Demonstrate, and apply the concept of genetic engineering and plant tissue culture.

  
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Sl. No.	Course Code	Title of the course	Employability	Entrepreneurship	Skill Development	Remarks
18	PGBOTCC3.6 (Pr)	Cytology and Molecular Biology	✓	✓	✓	EM - Understand and apply the concepts of central dogma & its regulation. EN - Apply knowledge on Molecular biology techniques to set a start up biotech farm. SD - Hands on training in cell and molecular biology techniques.
19	PGBOTCC4.1 (Th)	Research Methodology & Bio-Instrumentation	✓		✓	EM - Understand and apply the knowledge of biological research and bioinstrumentation. SD - Hands on training in handling bioinstruments.
20	PGBOTCC4.2 (Th)	Phytochemistry & Herbal Technology	✓	✓	✓	EM - Understand the nature, application of medicinal compounds in plants. EN - Apply knowledge of medicinal plants in startup projects. SD - Demonstrate extraction of phytochemicals.
21	PGBOTME4.3A (Th)	Genetics and Plant Biotechnology - I (Major Elective)	✓	✓	✓	EM - Demonstrate and apply the knowledge of plant tissue culture techniques and genetic engineering. EN - Apply the knowledge of tissue culture & RDT to start outsourcing services. SD - Demonstrate, and apply the concept of genetic engineering and plant tissue culture.
22	PGBOTME4.4A (Pr)	Genetics and Plant Biotechnology - I (Major Elective)	✓	✓	✓	EM - Demonstrate and apply the knowledge of plant tissue culture techniques and genetic engineering. EN - Apply the knowledge of tissue culture & RDT to start outsourcing services. SD - Demonstrate, and apply the concept of genetic engineering and plant tissue culture.
23	PGBOTME4.3B (Th)	Diversity and Ecology of algae (Major Elective)	✓		✓	EM - Apply the knowledge of economic and medicinal aspects of algae. SD - Acquire skills in teaching, & algal culture techniques.

  
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Sl. No.	Course Code	Title of the course	Employability	Entrepreneurship	Skill Development	Remarks
24	PGBOTME4.4B (Pr)	Advanced phycology and algal biotechnology (Major Elective)	✓	✓	✓	EM - Apply the economic and medicinal aspects of algae & bacteriology. EN - Apply knowledge on instrumentation to start up diagnostic lab and algal culture in microbiology & phycology respectively. SD - Acquire skills in teaching, pathological & laboratory techniques.
25	PGBOTME4.3C (Th)	Taxonomy of Angiosperms (Major Elective)	✓		✓	EM - Apply the methods of plant identification and their medicinal importance. SD - Acquire skills in teaching of angiosperm diversity and plant reproduction.
26	PGBOTME4.4C (Pr)	Taxonomy of Angiosperms (Major Elective)	✓		✓	EM - Apply the methods of plant identification and their medicinal importance. SD - Acquire skills in teaching of angiosperm diversity and plant reproduction.
27	PGBOTSOC1	Yoga			✓	SD - Understand and improve the decision-making capacity, build up confidence in their life
28	PGBOTSOC2	Communicative English	✓		✓	EM - Enhance their English language proficiency in the aspects of reading, writing, listening and speaking SD - Apply the requisite communicative skills and strategies to future careers
29	PGBOTSOC3	Value Education and Indian Culture	✓		✓	EM - Define, understand and apply the daily routine, self-evaluation & Integral Personality Development SD - Demonstrate and practice the Four Yogas
30	PGBOTSOC4	IPR/ Biosafety management / Post-harvest management of crops	✓		✓	EM - Role of IPR, Biosafety in biological research. SD - Hands on experience on IPR, Biosafety management

*S. K. Kande*

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<b>PROGRAMME CODE</b>	<b>PGCHEM</b>
<b>PROGRAMME NAME</b>	<b>MSc. Chemistry</b>

Sl No	Course Code	Title of the course	Employ ability	Enterpr enurshi p	Skill Develo pment	Remarks
1	PGCHEMMCT01	Inorganic Chemistry 01	✓	✓	-	The elementary knowledge on inorganic chemistry will enable students in future employment.
2	PGCHEMMCT02	Organic Chemistry 01	✓	✓	-	The elementary knowledge on organic chemistry will enable students in future employment.
3	PGCHEMMCT03	Physical Chemistry 01	✓	-	✓	The elementary knowledge on physical chemistry will enable students in future employment.
4	PGCHEMMCP01	Inorganic Chemistry 01 Practical	✓	✓	✓	The practical knowledge and the skill developed through hands on training will motivate for entrepreneurship.
5	PGCHEMMCP02	Organic Chemistry 01 Practical	✓	✓	✓	The practical knowledge and the skill developed through hands on training will motivate for entrepreneurship.
6	PGCHEMMCP03	Physical Chemistry 01 Practical	✓	✓	✓	The practical knowledge and the skill developed through hands on training will motivate for entrepreneurship.
7	PGCHEMMCT04	Inorganic Chemistry 02	✓	✓	-	The elementary knowledge on inorganic chemistry will enable students in future employment.
8	PGCHEMMCT05	Organic Chemistry 02	✓	✓	-	The elementary knowledge on organic chemistry will enable students in future employment.
9	PGCHEMMCT06	Physical Chemistry 02	✓	-	✓	The elementary knowledge on physical chemistry will enable students in future employment.
10	PGCHEMMCP04	Inorganic Chemistry 02 Practical	✓	✓	✓	The practical knowledge and the skill developed through hands on training will motivate for entrepreneurship.
11	PGCHEMMCP05	Organic Chemistry 02 Practical	✓	✓	✓	The practical knowledge and the skill developed through hands on training will motivate for entrepreneurship.



Sl No	Course Code	Title of the course	Employ ability	Enterpr enurshi p	Skill Develo pment	Remarks
12	PGCHEMMCP06	Physical Chemistry 02 Practical	✓	✓	✓	The practical knowledge and the skill developed through hands on training will motivate for entrepreneurship.
13	PGCHEMMCT07	Inorganic Chemistry 03	✓	✓	-	The elementary knowledge on inorganic chemistry will enable students in future employment.
14	PGCHEMMCT08	Organic Chemistry 03	✓	✓	-	The elementary knowledge on organic chemistry will enable students in future employment.
15	PGCHEMMCT09	Physical Chemistry 03	✓	-	✓	The elementary knowledge on physical chemistry will enable students in future employment.
16	PGCHEMMCP07	Inorganic Chemistry 03 Practical	✓	✓	✓	The practical knowledge and the skill developed through hands on training will motivate for entrepreneurship.
17	PGCHEMMCP08	Organic Chemistry 03 Practical	✓	✓	✓	The practical knowledge and the skill developed through hands on training will motivate for entrepreneurship.
18	PGCHEMMCP09	Physical Chemistry 03 Practical	✓	✓	✓	The practical knowledge and the skill developed through hands on training will motivate for entrepreneurship.
19	PGCHEMSCC	Interdisciplinary Adv. Chemistry	✓	✓	✓	The interdisciplinary advanced chemistry will enable students in future employment. It will also develop skill and make capatible for entrepreneurship.
20	PGCHEMOE01	Supramolecular Chemistry	✓	✓	✓	The supramolecular chemistry course will enable students in future employment. It will also develop skill and make capatible for entrepreneurship.
21	PGCHEMOE02	Medicinal Chemistry	✓	✓	✓	The medicinal chemistry will enable students in future employment. It will also develop skill and make capatible for entrepreneurship.
22	PGCHEMME01	Advanced Organic Chemistry 01	✓	✓	-	The advanced knowledge on inorganic chemistry will enable students in future employment and research.



Sl No	Course Code	Title of the course	Employ ability	Enterpr enurshi p	Skill Develo pment	Remarks
23	PGCHEMME02	Advanced Organic Chemistry 02	✓	✓	-	The advanced knowledge on inorganic chemistry will enable students in future employment and research.
24	PGCHEMME03	Advanced Inorganic Chemistry 01	✓	✓	-	The advanced knowledge on organic chemistry will enable students in future employment and research.
25	PGCHEMME04	Advanced Inorganic Chemistry 02	✓	✓	-	The advanced knowledge on organic chemistry will enable students in future employment and research.
26	PGCHEMME05	Advanced Physical Chemistry 01	✓	✓	-	The advanced knowledge on physical chemistry will enable students in future employment and research.
27	PGCHEMME06	Advanced Physical Chemistry 02	✓	-	✓	The advanced knowledge on physical chemistry will enable students in future employment and research.
28	PGCHEMOT01	Project and Presentation	✓	✓	✓	Project and presentation will make students a competent for future research, employment, and entrepreneur
29	PGCHEMOT02	Grand Viva and Seminar	✓	✓	✓	Grand Viva and seminar will make students competent for future research, employment, and entrepreneur
30	PGCHEMSOC01	Yoga	✓	✓	✓	Will develop mental and physical health and therefore self confidence will be built up for employment as well as entrepreneur
31	PGCHEMSOC02	Communicative English	✓	✓	✓	Communicative english will enable students in personality tests and communicate with investors and funding agencies to become a good entrepreneur.
32	PGCHEMSOC03	VECC	✓	✓	✓	Will develop mental stability and therefore self confidence will be built up for employment as well as entrepreneur
33	PGCHEMSOC04	Computer For Chemists	✓	✓	✓	Computer for chemists will make students competent for future research, employment, and entrepreneur

  
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<b>PROGRAMME CODE</b>	<b>UGCHEM</b>
<b>PROGRAMME NAME</b>	<b>B.Sc. Chemistry Honours</b>

Sl No	Course Code	Title of the course	Employability	Enterpr enurshi p	Skill Developm ent	Remarks
1	UGCHEMCC01	Organic Chemistry 01	✓	✓	✓	The elementary knowledge on organic chemistry will enable students in future employment. The practical knowledge and the skill developed through hands on training will motivate for entrepreneurship.
2	UGCHEMCC02	Physical Chemistry 01	✓	-	✓	The elementary knowledge on physical chemistry will enable students in future employment. The practical knowledge and the skill developed through hands on training will motivate to solve new problems.
3	UGCHEMCC03	Inorganic Chemistry 01	✓	-	✓	The elementary knowledge on inorganic chemistry will enable students in future employment. The practical knowledge and the skill developed through hands on training will motivate to solve new problems.
4	UGCHEMCC04	Organic Chemistry 02	✓	✓	✓	The elementary knowledge on organic chemistry will enable students in future employment. The practical knowledge and the skill developed through hands on training will motivate for entrepreneurship.
5	UGCHEMCC05	Physical Chemistry 02	✓	-	✓	The elementary knowledge on physical chemistry will enable students in future employment. The practical knowledge and the skill developed through hands on training will motivate to solve new problems.
6	UGCHEMCC06	Inorganic Chemistry 02	✓	-	✓	The elementary knowledge on inorganic chemistry will enable students in future employment. The practical knowledge and the skill developed through hands on training will motivate to solve new problems.

  
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Sl No	Course Code	Title of the course	Employ ability	Enterpr enurshi p	Skill Developm ent	Remarks
7	UGCHEMCC07	Organic Chemistry 03	✓	-	✓	The elementary knowledge on organic chemistry will enable students in future employment. The practical knowledge and the skill developed through hands on training will motivate to solve new problems.
8	UGCHEMCC08	Physical Chemistry 03	✓	-	✓	The elementary knowledge on physical chemistry will enable students in future employment. The practical knowledge and the skill developed through hands on training will motivate to solve new problems.
9	UGCHEMCC09	Inorganic Chemistry 03	✓	✓	✓	The elementary knowledge on inorganic chemistry will enable students in future employment. The practical knowledge and the skill developed through hands on training will motivate for entrepreneurship.
10	UGCHEMCC10	Organic Chemistry 04	✓	✓	✓	The elementary knowledge on organic chemistry will enable students in future employment. The practical knowledge and the skill developed through hands on training will motivate for entrepreneurship.
11	UGCHEMCC11	Inorganic Chemistry 04	✓	✓	✓	The elementary knowledge on inorganic chemistry will enable students in future employment. The practical knowledge and the skill developed through hands on training will motivate for entrepreneurship.
12	UGCHEMCC12	Organic Chemistry 05	✓	✓	✓	The elementary knowledge on organic chemistry will enable students in future employment. The practical knowledge and the skill developed through hands on training will motivate for entrepreneurship.
13	UGCHEMCC13	Inorganic Chemistry 05	✓	✓	✓	The elementary knowledge on inorganic chemistry will enable students in future employment. The practical knowledge and the skill developed through hands on training will motivate for entrepreneurship.

*Su. K. S.*  
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Sl No	Course Code	Title of the course	Employability	Enterpr enurshi p	Skill Developm ent	Remarks
14	UGCHEMCC14	Physical Chemistry 04	✓	-	✓	The elementary knowledge on physical chemistry will enable students in future employment. The practical knowledge and the skill developed through hands on training will motivate to solve new problems.
15	UGCHEMDSE01	Advanced Physical Chemistry	✓	✓	✓	The advanced knowledge on physical chemistry will enable students in future employment. The practical knowledge and the skill developed through hands on training will motivate for entrepreneurship.
16	UGCHEMDSE02	Analytical Methods of Chemistry	✓	✓	✓	The indepth knowledge on analytical chemistry will enable students in future employment. The practical knowledge and the skill developed through hands on training will motivate for entrepreneurship.
17	UGCHEMDSE03	Green Chemistry	✓	✓	✓	The knowledge on green chemistry will enable students in future employment. The practical knowledge on green chemistry and the skill developed through hands on training will motivate for entrepreneurship.
18	UGCHEMDSE04	Inorganic Materials of Industrial Importance	✓	✓	✓	The knowledge on industrially important materials will enable students in future employment. The practical knowledge and the skill developed through hands on training will motivate for entrepreneurship.
19	UGCHEMDSE05	Industrial Chemicals and Environment	✓	✓	✓	The knowledge on industrial chemicals and environment will enable students in future employment. The practical knowledge and the skill developed through hands on training will motivate for entrepreneurship.
20	UGCHEMSEC01	Pharmaceutical Chemistry	✓	✓	✓	The knowledge on phamacutical chemistry will enable students in future employment. The practical knowledge on phamacutical chemistry and the skill developed through hands on training will motivate for entrepreneurship.

*S. K. Das*  
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Sl No	Course Code	Title of the course	Employ ability	Enterpr enurshi p	Skill Developm ent	Remarks
21	UGCHEMSEC02	Fuel Chemistry	✓	✓	✓	The knowledge on fuel chemistry will enable students in future employment. The practical knowledge on fuel chemistry and the skill developed through hands on training will motivate for entrepreneurship.
22	UGCHEMGE01	Generic Elective 01	✓	-	✓	The elementary knowledge on chemistry will enable students in future employment. The practical knowledge will develop skill to solve practical problems.
23	UGCHEMGE02	Generic Elective 02	✓	-	✓	The elementary knowledge on chemistry will enable students in future employment. The practical knowledge will develop skill to solve practical problems.
24	UGCHEMGE03	Generic Elective 03	✓	-	✓	The elementary knowledge on chemistry will enable students in future employment. The practical knowledge will develop skill to solve practical problems.
25	UGCHEMGE04	Generic Elective 04	✓	-	✓	The elementary knowledge on chemistry will enable students in future employment. The practical knowledge will develop skill to solve practical problems.
26	UGCHEMAECCO 1	English for Communication	✓	✓	✓	Communicative english will enable students in personality tests and communitie with investors and funding agencies to become a good enterpreuner.
27	UGCHEMAECCO 2	Environmental Sciences	✓	✓	✓	This environmental sciences course has been designed to make the students aware to the environmental issues for the sustainable development of the environment.

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# PHYSICS, RKMVCC

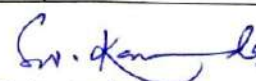
## 1.1.3 Average percentage of courses having focus on employability/ entrepreneurship/ skill development

Name of the Course	Course Code	Activities/Content with direct bearing on Employability/ Entrepreneurship/ Skill			Year of Introduction (during the last five years)	Remarks
		Employability	Entrepreneurship	Skill development		
Mathematical Physics - I	UGPHYCC01	✓	✓	✓	2017	<b>Employability:</b> Computer programmer and software modeling. <b>Skill Development:</b> Reasoning and analytic skill and abilities to solve complex problems. <b>Entrepreneurship:</b> Consultant in software solution services etc.
Mechanics	UGPHYCC02			✓	2017	<b>Skill Development:</b> Develop reasoning and analytic skill of the students which enhances their abilities to solve complex problems.
Electricity and Magnetism	UGPHYCC03	✓	✓	✓	2017	<b>Employability:</b> Designer or instructor in industrial production of electrical and electromagnetic devices. <b>Entrepreneurship:</b> Build up own setups for electrical instruments manufacturing. <b>Skill Development:</b> Hands on experience with instruments and having control over electrical equipments.
Waves and Optics	UGPHYCC04	✓		✓	2017	<b>Employability:</b> Designing and production of optical devices, scientific tools etc in industries. <b>Skill Development:</b> Hands on experience with modern instruments and control over high precision optical instruments.
Mathematical Physics - II	UGPHYCC05	✓	✓	✓	2017	<b>Employability:</b> Computer programmer and software modeling. <b>Skill Development:</b> Reasoning and analytic skill and abilities to solve complex problems. <b>Entrepreneurship:</b> Consultant in software solution services etc.
Thermal Physics	UGPHYCC06	✓		✓	2017	<b>Employability:</b> Designing and production of sensitive thermometers, heat engines and related scientific tools etc in industries. <b>Skill Development:</b> Hands on experience with modern instruments and control over high precision temperature measuring instruments.
Digital Systems and Applications	UGPHYCC07	✓	✓	✓	2017	<b>Employability:</b> Designing and production of electronic devices, scientific tools etc in industries. <b>Entrepreneurship:</b> Build up own setups for electronic device manufacturing. <b>Skill Development:</b> Hands on experience with advanced devices and having control over digital equipments.
Mathematical Physics - III	UGPHYCC08	✓	✓	✓	2017	<b>Employability:</b> Computer programmer and software modeling. <b>Skill Development:</b> Reasoning and analytic skill and abilities to solve complex problems. <b>Entrepreneurship:</b> Consultant in software solution services etc.
Elements of Modern Physics	UGPHYCC09	✓		✓	2017	<b>Employability:</b> Industrial applications like chemical and material science and their associated industries. <b>Skill Development:</b> Reasoning and analytic skill and abilities to solve complex problems.

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Name of the Course	Course Code	Activities/Content with direct bearing on Employability/ Entrepreneurship/ Skill			Year of Introduction (during the last five years)	Remarks
		Employability	Entrepreneurship	Skill development		
Analog Systems and Applications	UGPHYCC10	✓	✓	✓	2017	<b>Employability:</b> Designing and production of electronic devices, scientific tools etc in industries. <b>Entrepreneurship:</b> Build up own setups for electronic device manufacturing. <b>Skill Development:</b> Hands on experience with advanced devices and having control over electronic equipments.
Quantum Mechanics and Applications	UGPHYCC11	✓		✓	2017	<b>Employability:</b> Industrial applications like chemical and material science and their associated industries, Bioscience industries etc. <b>Skill Development:</b> Reasoning and analytic skill and abilities to solve complex problems.
Solid State Physics	UGPHYCC12	✓		✓	2017	<b>Employability:</b> Industries having material science domain along with electronics applications. <b>Skill Development:</b> Aims to develop reasoning and analytic skill to solve complex problems in solid state physics. Develops the theoretical basis of materials science.
Electromagnetic Theory	UGPHYCC13	✓		✓	2017	<b>Employability:</b> In industries - designer and/or supervisor of electromagnetic devices. <b>Skill Development:</b> Development of reasoning and analytic skill of the students and their abilities to solve complex problems.
Statistical Mechanics	UGPHYCC14	✓		✓	2017	<b>Employability:</b> In industries - Application of statistical thermodynamics (e.g. oil industry, polymer industry etc.) Computational along with in depth knowledge on probability theory, statistics along with computations help to get job in data science companies. <b>Skill Development:</b> Development of reasoning and analytic skill of the students and their abilities to solve complex problems in statistical mechanics.
Advanced Mathematical Physics - I	UGPHYDSE01	✓	✓	✓	2017	<b>Employability:</b> Computer programmer and software modeling. <b>Skill Development:</b> Reasoning and analytic skill and abilities to solve complex problems. <b>Entrepreneurship:</b> Consultant in software solution services etc.
Classical Dynamics	UGPHYDSE02			✓	2017	<b>Skill Development:</b> Reasoning and analytic skill and abilities to solve complex problems.
Communication Electronics	UGPHYDSE03	✓	✓	✓	2017	<b>Employability:</b> Scope to get job in mobile communication industries. <b>Entrepreneurship:</b> Build up own setups for electronic device manufacturing. <b>Skill Development:</b> Hands on experience with advanced devices and having control over communication technology.
Advanced Mathematical Physics - II	UGPHYDSE04	✓	✓	✓	2017	<b>Employability:</b> Computer programmer and software modeling. <b>Skill Development:</b> Reasoning and analytic skill and abilities to solve complex problems. <b>Entrepreneurship:</b> Consultant in software solution services etc.



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		Employability	Entrepreneurship	Skill development		
Nuclear and Particle Physics	UGPHYDSE05	✓		✓	2017	<b>Employability:</b> Designer and/or operator of particle accelerator and other nuclear physics instruments (e.g., detectors) in laboratories. <b>Skill Development:</b> Reasoning and analytic skill and abilities to solve complex problems.
Nano Materials and Applications	UGPHYDSE06	✓		✓	2017	<b>Employability:</b> Designer and tester of semiconductor devices and associated components in industries. <b>Skill Development:</b> Hands on experience with modern devices for characterization and fabrication of nano-scale materials.
Dissertation / Project work	UGPHYDSE07	✓	✓	✓	2017	<b>Employability:</b> Suitable choice of the project work is very much helpful towards employment. <b>Skill Development:</b> Reasoning and analytic skill and abilities to solve complex problems. <b>Entrepreneurship:</b> Project work builds up confidence level and cognitive development to go for independent business setup.
Value Education and Indian Culture	UGPHYSEC01			✓	2017	<b>Skill Development:</b> Define, understand and apply the daily routine, self evaluation & Integral Personality Development. Learn, and apply the Power of thoughts & the Science of Peace
Spoken Tutorial	UGPHYSEC02	✓		✓	2017	<b>Skill Development:</b> Enhancement of scientific temperament by practicing broader area of science
Mechanics	UGPHYGE01			✓	2017	<b>Skill Development:</b> Develop reasoning and analytic skill of the students which enhances their abilities to solve complex problems.
Thermal Physics and Statistical Mechanics	UGPHYGE02	✓		✓	2017	<b>Employability:</b> Designing and production of sensitive thermometers, heat engines and related scientific tools etc in industries. <b>Skill Development:</b> Hands on experience with modern instruments and control over high precision temperature measuring instruments.
Waves and Optics	UGPHYGE03	✓		✓	2017	<b>Employability:</b> Designing and production of optical devices, scientific tools etc in industries. <b>Skill Development:</b> Hands on experience with modern instruments and control over high precision optical instruments.
Electricity and Magnetism	UGPHYGE04	✓	✓	✓	2017	<b>Employability:</b> Designer or instructor in industrial production of electrical and electromagnetic devices. <b>Entrepreneurship:</b> Build up own setups for electrical instruments manufacturing. <b>Skill Development:</b> Hands on experience with instruments and having control over electrical equipments.
Mathematical Physics - I (Revised)	UGPHYCC01	✓	✓	✓	2021	<b>Employability:</b> Computer programmer and software modeling. <b>Skill Development:</b> Reasoning and analytic skill and abilities to solve complex problems. <b>Entrepreneurship:</b> Consultant in software solution services etc.

  
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		Employability	Entrepreneurship	Skill development		
Mechanics (Revised)	UGPHYCC02			✓	2021	<b>Skill Development:</b> Develop reasoning and analytic skill of the students which enhances their abilities to solve complex problems.
Advanced Mathematical Physics - I (Revised)	UGPHYDSE01	✓	✓	✓	2021	<b>Employability:</b> Computer programmer and software modeling. <b>Skill Development:</b> Reasoning and analytic skill and abilities to solve complex problems. <b>Entrepreneurship:</b> Consultant in software solution services etc.
Advanced Dynamics (New)	UGPHYDSE02			✓	2021	<b>Skill Development:</b> Reasoning and analytic skill and abilities to solve complex problems.
Advanced Mathematical Physics - II (Revised)	UGPHYDSE04	✓	✓	✓	2021	<b>Employability:</b> Computer programmer and software modeling. <b>Skill Development:</b> Reasoning and analytic skill and abilities to solve complex problems. <b>Entrepreneurship:</b> Consultant in software solution services etc.

  
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## PG MATHEMATICS, RKMVCC


### Employability/ entrepreneurship/ skill development

Sl no	Name of the Course	Course Code	Activities/Content with direct bearing on Employability/ Entrepreneurship/ Skill development			Year of introducti on (during the last five years)
			Employability	Entrepreneurship	Skill development	
1	Algebra-I	PGMATH CC101	Creative and innovative discussions in the classroom provide motivations to opt Research as a career option. Further, the Linear Algebra course gears up a student with a strong background for Image processing industry including analysis of satellite images and Robotics.		Class room interactions, problem solving sessions help the students to stress on the important areas of Advanced Algebra, which in turn improves their skills for teaching jobs at college and university level.	2018

*S. K. S. S.*  
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			Employability	Entrepreneurship	Skill development	
2	Real Analysis	PGMATH CC102	The classroom teaching, class tests and assignments train the students for the market of school, college and university teacher job. In addition, carrer may be developed as a Research Scientist, DevOps Engineer, Investment Analyst, Material Control Manager and more.		Assignments and problem solving sessions in this course will help a student to develop analytical and reasoning skills.	2018
3	Complex Analysis	PGMATH CC103	The course increases the prospect of getting jobs in industrial research areas such as Jet Engine designing, mathematical modeling, imaging, shape analysis etc.			2018

  
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			Employability	Entrepreneurship	Skill development	
4	Ordinary & Partial Differential Equations	PGMATH CC104	Ability of solving differential equations will create an opportunity for the students to work as a Mathematical modeller in several industries.	Problem solving, interactive debates and discussions in classroom activities familiarize students with ideas and concepts and notations which allow understanding of more advanced work.		2018
5	Numerical Analysis	PGMATH CC105	Expertise in solving numerical problems may create job opportunity in IT industries.		Students can acquire skills to solve complicated engineering problems analytically.	2018

  
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			Employability	Entrepreneurship	Skill development	
6	Computer Programmi ng in C++ and Numerical Practical using GNU Octave/Scil ab /Matlab	PGMATH CC106	Practical classes improve the skills to handle computers and some important computer programming languages which create job opportunity in IT industries for the job of software developer, website designer, etc.		Students can acquire skills to solve complicated engineering problems which cannot be solved analytically.	2018


  
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			Employability	Entrepreneurship	Skill development	
7	YOGA	PGMATH SS01	For the Yoga Professionals, there are several job options available both in the government & private sectors. One can also be self-employed by opening their own yoga center. Job designations in this field includes Yoga Instructor, Yoga Therapist, Yoga Advisor, Yoga Specialist, Yoga Practitioner, Yoga Teacher, Research Officer- Yoga and Naturopathy, Yoga Aerobic Instructor Yoga Consultant, Publication Officer (Yoga) and Yoga Manager.		Students can develop skill of self-care, self-regulation, relaxation, skills of imagination and creativity, communication and confidence, persistence, teamwork, etc.	2018

  
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			Employability	Entrepreneurship	Skill development	
8	Algebra-II	PGMATH CC201	Creative and innovative discussions in the classroom provide motivations to opt Research as a career option. Further, the Linear Algebra course gears up a student with a strong background for Image processing industry including analysis of satellite images and Robotics.			2018
9	Measure and Integration	PGMATH CC202		Measure theory provides the natural language for discussing integration and typically covers many topics including $L_p$ spaces, Fourier transforms, various super useful inequalities, etc.		2018

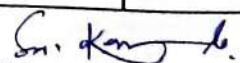
  
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			Employability	Entrepreneurship	Skill development	
10	General Topology	PGMATH CC203	This knowledge will help them to make an entry in the Bio-Medical Imaging industry at their research level.		Group discussions, class tests and assignments trains the students to develop analytical and reasoning skills required for teaching jobs at college and university level.	2018
11	Classical Mechanics & Theory of Relativity	PGMATH CC204	This course is highly beneficial for the students to make career as a research scientist in broad research areas namely Applied Mathematics, Physics and Mechanical Engineering. The course also opens up job opportunities in industrial research areas involving designing and manufacturing of machines.			2018

  
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			Employability	Entrepreneurship	Skill development	
12	Linear Algebra & Multivariate Calculus	PGMATH CC205	Classroom interactions & group discussions train the students to prepare for teaching job at schools, colleges, and clerical and officer level jobs in Government and non- government banking sectors. The course enables the students to make career in industrial image processing and signal processing.	Problem solving, interactive debates and discussions in classroom activities familiarize students with ideas and concepts and notations which allow understanding of more advanced work.		2018
13	Integral transforms and Integral Equations	PGMATH CC206			Techniques for solving many scientific and engineering problems are taught.	2018

  
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			Employability	Entrepreneurship	Skill development	
14	Communica tive English	PGMATH SS02	Communicative English is important as it can help a student to see value in their studies, in a meaningful way. Strengthening your communication skills in English is necessary, and is a powerful tool that can be used for business, travel or simply to have a conversation in a different country.			2018
15	Functional Analysis	PGMATH CC301	Functional Analysis is the main tool used to develop National Occupational Standards. It involves analyzing areas of work and identifying the outcomes that people should achieve.	Functional Analysis contributes to the identification and development of possible NOS titles.		2018

*S.M. Khan*  
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			Employability	Entrepreneurship	Skill development	
16	Dynamical System Analysis	PGMATH CC302	After studying Dynamical System Analysis one may find job in renowned software companies as Software simulation developer, System dynamics modeller.		Students can acquire skills to solve complicated engineering problems which cannot be solved analytically.	2018
17	Advanced Real Analysis-I	PGMATH CE301	The classroom teaching, class tests and assignments train the students for the market of school, college and university teacher job. In addition, carrer may be developed as a Research Scientist, DevOps Engineer, Investment Analyst, Material Control Manager and more.		Assignments and problem solving sessions in this course will help a student to develop analytical and reasoning skills.	2018

  
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			Employability	Entrepreneurship	Skill development	
18	Advanced Complex Analysis-I	PGMATH CE302	The course increases the prospect of getting jobs in industrial research areas such as Jet Engine designing, mathematical modeling, imaging, shape analysis etc.			2018
19	Algebraic Topology-I	PGMATH CE303	This knowledge will help them to make an entry in the Bio-Medical Imaging industry at their research level. Creative and innovative discussions in the classroom provide motivations to opt Research as a career option. Further, the Linear Algebra course gears up a student with		Group discussions, class tests and assignments trains the students to develop analytical and reasoning skills required for teaching jobs at college and university level.	2018

  
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			Employability	Entrepreneurship	Skill development	
20	Differential Manifold-I	PGMATH CE304			The course deals with the geometry of smooth shapes and smooth spaces.	2018
21	Cosmology- I	PGMATH CE305	One may find job as Cosmologist by studying Cosmology.		Students may develop investigative skills, skill of defining a research problem, communication skills, skill of developing and writing research proposals, computational / mathematical skills.	2018



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Sl no	Name of the Course	Course Code	Activities/Content with direct bearing on Employability/ Entrepreneurship/ Skill development			Year of introducti on (during the last five years)
			Employability	Entrepreneurship	Skill development	
22	Mathematical Biology-I	PGMATH CE306	The combination of biology and maths has become an essential discipline in the understanding of life processes. Career options in Mathematical Biology include biostatistics, epidemiology, bioinformatics, mathematical biology, and population ecology. One can find these bio and maths jobs in human genetics, health care, pharmaceuticals and conservation.	Biological scientists use mathematics as a tool to model the evolution and growth of an organism, and such a model acts as a surrogate for live organisms in the testing of medicines or chemicals. Engineers with knowledge of biology and mathematics have improved the design of artificial limbs and organs, while astronomers use biology and mathematics to search for life in the universe.	Students may learn the skill of relating and using mathematics in formulating real life problems.	2018


  
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			Employability	Entrepreneurship	Skill development	
23	Operation Research-I	PGMATH CE307	Operations research analysts are high-level problem-solvers who use advanced techniques, such as optimization, data mining, statistical analysis and mathematical modeling, to develop solutions that help businesses and organizations operate more efficiently and cost-effectively. In addition, one may also serve as Decision Scientist, Algorithm Developer, Operation research scientist, Data Analyst, etc.		A degree program in operations research may develop technical and soft skills. One may learn about advanced math, analytical reasoning and problem-solving techniques. These skills can help students to perform daily tasks and succeed in an operations research analyst role.	2018

  
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			Employability	Entrepreneurship	Skill development	
24	Continuum Mechanics( Solid)-I	PGMATH CE308	This course is highly beneficial for the students to make career as a research scientist in broad research areas namely Applied Mathematics, Physics and Mechanical Engineering. The course also opens up job opportunities in industrial research areas involving designing and manufacturing of machines.		Classroom teaching may develop the ability to engage with unfamiliar problems and identify relevant solution strategies, ability to work in a team, and ability to meet regular deadlines while balancing competing commitments.	2018


  
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			Employability	Entrepreneurship	Skill development	
25	Programmin g in PYTHON & LaTex	PGMATH AE301	Learning the programming skills in PYTHON & LaTeX will develop the interest of student to be employed as PYTHON Developer, Data Scientist, Web Developer, Machine Learning Engineer, Test Automation Engineer, Data Analyst, Educator. Students may also start their career with Freelance projects.		Command on a programming language can help students develop vital skills in problem-solving, logic, and flexibility.	2018
26	VE & IC	PGMATH SS03				2018

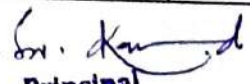
  
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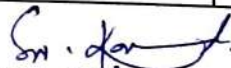
Sl no	Name of the Course	Course Code	Activities/Content with direct bearing on Employability/ Entrepreneurship/ Skill development			Year of introduction (during the last five years)
			Employability	Entrepreneurship	Skill development	
27	Number theory	PGMATH CC401	Proper understanding of the subject may lead the students to work as Deep Learning Data Scientist, Technical Architect, teacher (in schools as well as in colleges and universities), etc.		The subject will develop a solid familiarity with arithmetics and the skill to understand algebra.	2018
28	Discrete Mathematics	PGMATH CC402	Good knowledge and understanding of the subject may lead the students to work as Data scientist, Software engineer, Bioinformatician, etc.		Learners will become familiar with a broad range of mathematical objects like sets, functions, relations, graphs, that are omnipresent in computer science. An important goal of discrete mathematics is to develop students' ability to think abstractly.	2018

  
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			Employability	Entrepreneurship	Skill development	
29	Advanced Real Analysis-II	PGMATH CE401	The classroom teaching, class tests and assignments train the students for the market of school, college and university teacher job. In addition, carrer may be developed as a Research Scientist, DevOps Engineer, Investment Analyst, Material Control Manager and more.		Assignments and problem solving sessions in this course will help a student to develop analytical and reasoning skills.	2018
30	Advanced Complex Analysis-II	PGMATH CE402	The course increases the prospect of getting jobs in industrial research areas such as Jet Engine designing, mathematical modeling, imaging, shape analysis etc.			2018

  
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Sl no	Name of the Course	Course Code	Activities/Content with direct bearing on Employability/ Entrepreneurship/ Skill development			Year of introducti on (during the last five years)
			Employability	Entrepreneurship	Skill development	
31	Algebraic Topology-II	PGMATH CE403	This knowledge will help them to make an entry in the Bio-Medical Imaging industry at their research level. Creative and innovative discussions in the classroom provide motivations to opt Research as a career option. Further, the Linear Algebra course gears up a student with		Group discussions, class tests and assignments trains the students to develop analytical and reasoning skills required for teaching jobs at college and university level.	2018
32	Differential Manifold-II	PGMATH CE404			The course deals with the geometry of smooth shapes and smooth spaces.	2018


  
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			Employability	Entrepreneurship	Skill development	
33	Cosmology-II	PGMATH CE405	One may find job as Cosmologist by studying Cosmology.		Students may develop investigative skills, skill of defining a research problem, communication skills, skill of developing and writing research proposals, computational / mathematical skills.	2018

  
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			Employability	Entrepreneurship	Skill development	
34	Mathematical Biology-II	PGMATH CE406	The combination of biology and maths has become an essential discipline in the understanding of life processes. Career options in Mathematical Biology include biostatistics, epidemiology, bioinformatics, mathematical biology, and population ecology. One can find these bio and maths jobs in human genetics, health care, pharmaceuticals and conservation.	Biological scientists use mathematics as a tool to model the evolution and growth of an organism, and such a model acts as a surrogate for live organisms in the testing of medicines or chemicals. Engineers with knowledge of biology and mathematics have improved the design of artificial limbs and organs, while astronomers use biology and mathematics to search for life in the universe.	Students may learn the skill of relating and using mathematics in formulating real life problems.	2018


  
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			Employability	Entrepreneurship	Skill development	
34	Mathematical Biology-II	PGMATH CE406	The combination of biology and maths has become an essential discipline in the understanding of life processes. Career options in Mathematical Biology include biostatistics, epidemiology, bioinformatics, mathematical biology, and population ecology. One can find these bio and maths jobs in human genetics, health care, pharmaceuticals and conservation.	Biological scientists use mathematics as a tool to model the evolution and growth of an organism, and such a model acts as a surrogate for live organisms in the testing of medicines or chemicals. Engineers with knowledge of biology and mathematics have improved the design of artificial limbs and organs, while astronomers use biology and mathematics to search for life in the universe.	Students may learn the skill of relating and using mathematics in formulating real life problems.	2018


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			Employability	Entrepreneurship	Skill development	
35	Operation Research-II	PGMATH CE407	Operations research analysts are high-level problem-solvers who use advanced techniques, such as optimization, data mining, statistical analysis and mathematical modeling, to develop solutions that help businesses and organizations operate more efficiently and cost-effectively. In addition, one may also serve as Decision Scientist, Algorithm Developer, Operation research scientist, Data Analyst, etc.		A degree program in operations research may develop technical and soft skills. One may learn about advanced math, analytical reasoning and problem-solving techniques. These skills can help students to perform daily tasks and succeed in an operations research analyst role.	2018

  
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Sl no	Name of the Course	Course Code	Activities/Content with direct bearing on Employability/ Entrepreneurship/ Skill development			Year of introduction (during the last five years)
			Employability	Entrepreneurship	Skill development	
36	Continuum Mechanics(Fluid)-II	PGMATH CE408	This course is highly beneficial for the students to make career as a research scientist in broad research areas namely Applied Mathematics, Physics and Mechanical Engineering. The course also opens up job opportunities in industrial research areas involving designing and manufacturing of machines.		Classroom teaching may develop the ability to engage with unfamiliar problems and identify relevant solution strategies, ability to work in a team, and ability to meet regular deadlines while balancing competing commitments.	2018
37	Project Work** (Viva Voce + Dissertation)	PGMATH CC403			The skill of planning and forecasting, management skilled, risk management, tracking and monitoring and team work may be developed. Also, one can gain subject matter expertise by an active participation in project work.	2018

  
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Sl no	Name of the Course	Course Code	Activities/Content with direct bearing on Employability/ Entrepreneurship/ Skill development			Year of introducti on (during the last five years)
			Employability	Entrepreneurship	Skill development	
38	Seminar Presentatio n	PGMATH SS04			Students may develop investigative skills, skill of defining a research problem, communication skills, skill of team management, time management skill, skill of speaking in front of large audience, enthusiam and honesty and a great body language.	2018

  
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## UG MATHEMATICS, RKMVCC

### Employability/ entrepreneurship/ skill development

Name of the Course	Course Code	Activities/Content with direct bearing on Employability/ Entrepreneurship/ Skill development			Year of introduction (during the last five years)
		Employability	Entrepreneurship	Skill development	
Calculus, Geometry & Differential Equation & Practical	UGMATHC C01	Ability of solving differential equations will create an opportunity for the students to work as an Mathematical modeller in several industries. The Mathematical theory regarding various geometrical objects may help the students to make career in computer imaging and mapping and image processing.	Problem solving, interactive debates and discussions in classroom activities familiarize students with ideas and concepts and notations which allow understanding of more advanced work.	Practical sessions provide a framework for modeling systems in which there is change, and a way to deduce the predictions of such models.	2017

  
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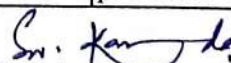
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Name of the Course	Course Code	Activities/Content with direct bearing on Employability/ Entrepreneurship/ Skill development			Year of introduction (during the last five years)
		Employability	Entrepreneurship	Skill development	
Algebra & Tutorial	UGMATHC C02	Basic knowledge of RSA cryptosystem and Digital signature protocol will help the student to gear up for a future career on Cryptography, the science of encryption and decryption of sensitive data, which is now a very important and thriving sector under IT industry. Besides, one may develop career as mathematician, astronomer, chemist, physicist, statisticians, actuary, air traffic controller, architect, computer engineers and analyst, market research analyst, etc.		Problem solving sessions improve critical and analytical thinking, quantitative reasoning, ability to manipulate precise and intricate ideas and construct logical arguments.	2017
Real Analysis & Practical	UGMATHC C03	The classroom teaching, class tests and assignments train the students for the market of school, college and university teacher job. In addition, career may be developed as a Research Scientist, DevOps Engineer, Investment Analyst, Material Control Manager and more.	Regular practice and classroom teaching may develop an expertise in some of the key concepts of Real Analysis, such as convergence, compactness and convexity which have become central to economic theory	Problem solving sessions and practicals help to develop reasoning ability and deductive thinking in students.	2017

  
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Name of the Course	Course Code	Activities/Content with direct bearing on Employability/ Entrepreneurship/ Skill development			Year of introduction (during the last five years)
		Employability	Entrepreneurship	Skill development	
Differential Equations & Vector Calculus & Practical	UGMATHC C04	Ability of solving differential equations will create an opportunity for the students to work as a Mathematical modeller in several industries. Vector calculus is used extensively in physics and engineering, especially in the description of electromagnetic fields, gravitational fields, and fluid flow.	Problem solving, interactive debates and discussions in classroom activities familiarize students with ideas and concepts and notations which allow understanding of more advanced work.	Problem solving, interactive debates and discussions in classroom activities familiarize students with ideas and concepts and notations which allow understanding of more advanced work.	2017
Theory of Real Functions & Introduction to Metric Spaces& Tutorial	UGMATHC C05			Problem solving sessions improves critical and analytical thinking, quantitative reasoning, ability to manipulate precise and intricate ideas	2017
Group Theory I & Tutorial	UGMATHC C06	Good understanding of the subject may create interest of students for doing reasearch and work as Research Scientist, Machine learning engineer, Software engineer, etc.		Problem solving sessions improves critical and analytical thinking, quantitative reasoning, ability to manipulate precise and intricate ideas	2017
Numerical Methods	UGMATHC C07	Expertise in solving numeriactal problems may create job opportunity in IT industries.		Students can acquire skills to solve complicated engineering problems which	2017

  
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Name of the Course	Course Code	Activities/Content with direct bearing on Employability/ Entrepreneurship/ Skill development			Year of introduction (during the last five years)
		Employability	Entrepreneurship	Skill development	
Riemann Integration and Series of Functions	UGMATHC C08	The classroom teaching, class tests and assignments train the students for the market of school, college and university teacher job. In addition, career may be developed as a Research Scientist, DevOps Engineer, Investment Analyst, Material Control Manager and more.		Assignments and problem solving sessions in this course will help a student to develop analytical and reasoning skills.	2017
Multivariate Calculus	UGMATHC C09	Being one of the core tools of applied mathematics, it is used in many fields such as computer graphics, physical sciences, economics and engineering.			2017
Ring Theory and Linear Algebra I	UGMATHC C10	Classroom interactions & group discussions train the students to prepare for teaching job at schools, colleges, and clerical and officer level jobs in Government and non-government banking sectors. The course enables the students to make career in industrial image processing and signal processing.		Unit tests and quizzes will help the students to develop analytical skills.	2017

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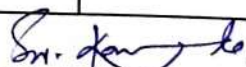
Name of the Course	Course Code	Activities/Content with direct bearing on Employability/ Entrepreneurship/ Skill development			Year of introduction (during the last five years)
		Employability	Entrepreneurship	Skill development	
Partial Differential Equations and Applications & Practical	UGMATHC C11	Ability of solving differential equations will create an opportunity for the students to work as a Mathematical modeller in several industries.	Problem solving, interactive debates and discussions in classroom activities familiarize students with ideas and concepts and notations which allow understanding of more advanced work.	Problem solving, interactive debates and discussions in classroom activities familiarize students with ideas and concepts and notations which allow understanding of more advanced	2017
Group Theory II & Tutorial	UGMATHC C12	Good understanding of the subject may create interest of students for doing research and work as Research Scientist, Machine learning engineer, Software engineer, etc.		Problem solving sessions improves critical and analytical thinking, quantitative reasoning, ability to manipulate precise and intricate ideas	2017
Metric Spaces and Complex Analysis & Tutorial	UGMATHC C13	The course increases the prospect of getting jobs in industrial research areas such as Jet Engine designing, mathematical modeling, imaging, shape analysis etc.		Problem solving sessions improves critical and analytical thinking, quantitative reasoning, ability to manipulate precise and intricate ideas	2017

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Name of the Course	Course Code	Activities/Content with direct bearing on Employability/ Entrepreneurship/ Skill development			Year of introduction (during the last five years)
		Employability	Entrepreneurship	Skill development	
Ring Theory and Linear Algebra II & Tutorial	UGMATHC C14	Classroom interactions & group discussions train the students to prepare for teaching job at schools, colleges, and clerical and officer level jobs in Government and non-government banking sectors. The course enables the students to make career in industrial image processing and signal processing.		Problem solving sessions improves critical and analytical thinking, quantitative reasoning, ability to manipulate precise and intricate ideas and construct logical arguments.	2017
Linear Programming & Tutorial	UGMATHD SE01	The course focuses to develop mathematical knowledge and the analytical skills of the students for the jobs of economic analyzer, business strategy maker in industries, Share market Analyst and various public and private sectors.		Problem solving sessions improves critical and analytical thinking, quantitative reasoning, ability to manipulate precise and intricate ideas and construct logical arguments.	2017

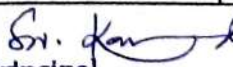
  
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Name of the Course	Course Code	Activities/Content with direct bearing on Employability/ Entrepreneurship/ Skill development			Year of introduction (during the last five years)
		Employability	Entrepreneurship	Skill development	
Probability and Statistics & Tutorial	UGMATHD SE02	This course opens up the opportunity for the job market of Data Analysts, Risk Analysts, Business Analysts, Data Scientist etc in a wide range of private sector enterprises. Also this course provides the basic knowledge required for Actuarial science which is linked with future job prospects in Insurance sector. Furthermore, by studying this course one can also prepare for Indian Statistical Services, Indian Economic Services etc.		Problem solving sessions improves critical and analytical thinking, quantitative reasoning, ability to manipulate precise and intricate ideas and construct logical arguments.	2017
Mechanics & Tutorial	UGMATHD SE03	This course is highly beneficial for the students to make career as a research scientist in broad research areas namely Applied Mathematics, Physics and Mechanical Engineering. The course also opens up job opportunities in industrial research areas involving designing and manufacturing of machines.		Problem solving sessions improves critical and analytical thinking, quantitative reasoning, ability to manipulate precise and intricate ideas and construct logical arguments.	2017

  
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Name of the Course	Course Code	Activities/Content with direct bearing on Employability/ Entrepreneurship/ Skill development			Year of introduction (during the last five years)
		Employability	Entrepreneurship	Skill development	
Bio Mathematics & Practical	UGMATHD SE04	This course will be very helpful to be a research scientist in broad research areas like Population Dynamics, Biofluid Mechanics, Developmental Biology etc.	The course material provides the capability of developing analytical and predictive models of Biological & Medical systems including the Epidemiological models and related	Problem solving, interactive debates and discussions in classroom activities familiarize students with ideas and concepts and notations which allow understanding of more advanced	2017
Point Set Topology & Tutorial	UGMATHD SE05	This knowledge will help them to make an entry in the Bio-Medical Imaging industry at their research level.		Group discussions, class tests and assignments trains the students to develop analytical and reasoning skills required for teaching jobs at college and university level. Further, problem solving sessions improves critical and analytical thinking, quantitative	2017
Logic and Sets	UGMATHS EC01	Jos perspectives of the subject Logic and sets may include the pots as data scientist, operations analyst, multimedia designer, graphic designer,			2017

  
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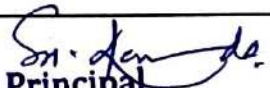
Name of the Course	Course Code	Activities/Content with direct bearing on Employability/ Entrepreneurship/ Skill development			Year of introduction (during the last five years)
		Employability	Entrepreneurship	Skill development	
Algebra & Tutorial	UGMATHG E01	The Mathematical theory regarding various geometrical objects may help the students to make career in computer imaging and mapping and image processing.		Problem solving sessions improves critical and analytical thinking, quantitative reasoning, ability to manipulate precise and intricate ideas	2017
Calculus, Geometry and Differential Equation & Tutorial	UGMATHG E02	Ability of solving differential equations will create an opportunity for the students to work as a Mathematical modeller in several industries. The Mathematical theory regarding various geometrical objects may help the students to make career in computer imaging and mapping and image processing.	Problem solving, interactive debates and discussions in classroom activities familiarize students with ideas and concepts and notations which allow understanding of more advanced work.	Problem solving sessions improves critical and analytical thinking, quantitative reasoning, ability to manipulate precise and intricate ideas and construct logical arguments.	2017
Numerical Methods & Tutorial	UGMATHG E03	Expertise in solving numerical problems may create job opportunity in IT industries.		Problem solving sessions improves critical and analytical thinking, quantitative reasoning, ability to manipulate precise and intricate ideas	2017

  
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Name of the Course	Course Code	Activities/Content with direct bearing on Employability/ Entrepreneurship/ Skill development			Year of introduction (during the last five years)
		Employability	Entrepreneurship	Skill development	
Group Theory & Tutorial	UGMATHGE04			Problem solving sessions improves critical and analytical thinking, quantitative reasoning, ability to manipulate precise and intricate ideas	2017

  
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Programme Code	UGMCB
Programme name	BSc. Microbiology Honours

Sl no	Course code	Title of the course	Employability	Entrepreneurship	Skill development	Remarks
1	UGMCBCC01	Introduction to Microbiology and Microbial Diversity	✓		✓	It enables development of skills in handling basic lab instruments of Microbiology and employability in such labs.
2	UGMCBCC02	Bacteriology	✓	✓	✓	Development of skills in basics of bacterial physiology and employability in such labs or Pharmaceutical Companies, Research Centres, Private Clinics, and/or industry where knowledge of bacteriology is an essential criteria.
3	UGMCBCC03	Biochemistry	✓		✓	Skill development in Quantitative and qualitative analysis of biochemical events within microbial cell and generation of employment in biochemistry laboratory
4	UGMCBCC04	Virology	✓		✓	Development of skills in basics of viral architecture and pathogenesis and employability in areas like Pharmaceutical Companies, Research Centres, Private Clinics, Human Immunology Laboratory, Government Hospitals, or as teachers in reputed Colleges and Universities, etc
5	UGMCBCC05	Microbial Physiology and Metabolism	✓		✓	The development of skills in culturing microbes in laboratory conditions using different environmental parameters like pH, temperature, oxic and anoxic conditions, etc., and employability in biochemical laboratories and companies.
6	UGMCBCC06	Cell Biology			✓	Skill development in theoretical database for cell cycle, regulation & Proteomics which is very important step for future research and development in practical field.
7	UGMCBCC07	Molecular Biology	✓		✓	It develops skills in comprehensive analysis of biomolecules and molecular mechanism, development of employment in biotechnology Industry

  
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Sl no	Course code	Title of the course	Employability	Entrepreneurship	Skill development	Remarks
8	UGMCBCC08	Microbial Genetics	✓		✓	Skill development in different genetic exchange techniques and in use of bacteria and virus as fundamental gene transfer tool will help to increase the chance of employability in molecular diagnostic and gene therapy lab
9	UGMCBCC09	Environmental Microbiology	✓	✓	✓	The skill development in this field helps in environment modeling for sustainable ecology. Employability and entrepreneurship are in environmental monitoring and waste management.
10	UGMCBCC10	Food and Dairy Microbiology	✓	✓	✓	The development of skills in detection of foodborne pathogen, fermentation process, and dairy starter culture. Employability and entrepreneurship in pathology, food processing, and dairy sectors.
11	UGMCBCC11	Industrial Microbiology	✓	✓	✓	Skill development in isolating industrially important microbial strains, designing the fermentation media, conditions, bioreactors and product recovery. It increases ability to be employed in biotech and related industries as well as develop such industry as entrepreneur.
12	UGMCBCC12	Immunology	✓	✓	✓	Skill development in different modern immunological techniques and haematology will be helpful in employability of students to detect pathogen and disease diagnosis in immunology or diagnostic lab as well as become an entrepreneur in developing pathological lab
13	UGMCBCC13	Medical Microbiology	✓	✓	✓	Improves skills in identifying bacterial strains and their antibiotic sensitivity. Students can develop diagnostic lab as an entrepreneur, can also be employed in such lab or hospitals, can be involved in epidemiological study, management and control of diseases.

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Sl no	Course code	Title of the course	Employability	Entrepreneurship	Skill development	Remarks
14	UGMCBCC14	Recombinant DNA Technology	✓	✓	✓	Skill development in molecular cloning and gene sequencing will assist to get employment in pharmaceutical and agricultural industry; forensic laboratory as well as can develop a molecular biology lab or such lab based services as an entrepreneur.
15	UGMCBDSE01	Inheritance Biology	✓		✓	The field of Inheritance Biology allows to work in medical as well as scientific research. Genetics is a wide field and it has applicability and employability in cancer research, Genetic Counselors, Plant/ Animal Breeding, Nutrigenomics, DNA sample analysis, Clinical Scientist, etc.
16	UGMCBDSE02	Microbial Biotechnology	✓	✓	✓	The development of skills in the different microbial biotechnological processes increases employability and entrepreneurship in food, agriculture, medicine, environment sectors.
17	UGMCBDSE03	Project Work	✓		✓	Students should be able to conduct and complete an independent project, demonstrate knowledge of current research and skill of using current tools and techniques specific to the field of study. They should gain the ability to present and defend their project to a panel of teachers. Such experiences help them to become researchers and can be employable in suitable sectors.
18	UGMCBDSE04	Instrumentation and Biotechniques	✓		✓	Analysis of microbial cells using different techniques and various instruments enables development of skill and employment in Microbial Industry.
19	UGMCBDSE05	Advances in Microbiology	✓		✓	It allows analytical skill development in the field of Metagenomic study & Future Pathogenicity and employability in disease management area and pathology laboratory.
20	UGMCBSEC01	Value Education & Indian Culture	✓		✓	It gives employability and skill development.

Sl no	Course code	Title of the course	Employability	Entrepreneurship	Skill development	Remarks
21	UGMCBSEC02	Online course	✓		✓	The skill development in intuitive user-interface helps to draw diagram in rich graphical representation with own design. Employability is linked in browse and modify existing SBML models with references to existing databases, simulate and view the dynamics through an intuitive graphical interface.
22	UGMCBGE01	Bacteriology and Virology	✓		✓	Development of skills in handling basic techniques of Microbiology Lab and allows employability in such labs.
23	UGMCBGE02	Microbes in Environment	✓	✓	✓	The skill development helps in environment modeling for sustainable ecology. Employability and entrepreneurship are in environmental monitoring and waste management.
24	UGMCBGE03	Industrial & Food Microbiology	✓	✓	✓	It allows the development of skills in detection of foodborne pathogen, fermentation process, and starter culture. Also skill development in isolating industrially important microbial strains, designing the fermentation media, conditions, bioreactors and product recovery. It increases ability to be employed in biotech and related industries as well as develop such industry as entrepreneur.
25	UGMCBGE04	Genetic Engineering and Biotechnology	✓	✓	✓	Skill development in molecular cloning and gene sequencing will assist to get employment in pharmaceutical and agricultural industry; forensic laboratory as well as can develop a molecular biology lab or such lab based services as an entrepreneur.
26	UGMCBGE05	Microbial Genetics and Molecular Biology	✓		✓	It develops skills in comprehensive analysis of biomolecules and molecular mechanism, development of employment in biotechnology Industry. Skill development in different genetic exchange techniques and in use of bacteria and virus as fundamental gene transfer tool will help to increase the chance of employability in molecular diagnostic and gene therapy lab

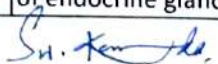
Sl no	Course code	Title of the course	Employa bility	Entrepre neurship	Skill develop ment	Remarks
27	UGMCBAECC01	English Communication	✓	✓	✓	It gives idea of Entrepreneurship, Employability and Skill Development
28	UGMCBAECC02	Environmental Science	✓	✓	✓	It gives idea of Entrepreneurship, Employability and Skill Development

  
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**B.Sc. Zoology syllabus (Employability, Entrepreneur and Skill development)**

Course code	Title of the Course	Activities			Remarks
		Employability	Entrepreneurship	Skill development	
UGZOOCC 01	Non-chordates I: Protists to pseudocoelomates	✓		✓	EM - Apply and evaluate the biological and medicinal importance of various larvae and sponges respectively SD - Acquire skills in teaching the structural and functional features of invertebrate animal life's diversity
UGZOOCC 02	Principles of ecology	✓	✓	✓	EM - Analyze, apply and evaluate the various concepts of population and community and relate the impact of man on the ecological balance EN - Apply the acquired knowledge to solve the environmental and ecological problems SD - Demonstrate and evaluate the interactions among various environmental parameters
UGZOOCC 03	Non-chordates II: coelomates	✓	✓	✓	EM - Illustrate different vector born diseases and the related life cycles, epidemiology, pathology, diagnosis, symptoms and treatments and take part in controlling these diseases . EN - Demonstrate and apply various techniques of sericulture, apiculture, lac culture and pearl culture. Thus create the enterprenureship. SD - Understand and apply the basics of sericulture, apiculture, lac culture and pearl culture.
UGZOOCC 04	Cell biology	✓		✓	EM - Compare and apply the techniques to measure and stain different cell types. SD - Know how to measure and stain different cell types.
UGZOOCC 05	Diversity of chordates	✓	✓	✓	EM, EN, SD - Apply the knowledge of poultry managements and different breeds of domestic animals.
UGZOOCC 06	Animal physiology: Controlling and coordinating systems	✓	✓	✓	EM, EN- Examine histology different tissues through preparation of temporary and peranent slides SD - Demonstrate and evaluate the histology of endocrine glands.


  
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Course code	Title of the Course	Activities			Remarks
		Employ ability	Entrepreneurs hip	Skill develop ment	
UGZOCC 07	Fundamentals of biochemistry	✓	✓	✓	EM, EN - Analyse and estimate pH, carbohydrates, proteins, lipids and chromatographic separation of amino acids SD - Demonstrate, apply and evaluate some instrumentation such as microscopy, chromatography, electrophoresis, centrifugation, spectrophotometry etc.
UGZOCC 08	Comparative anatomy of vertebrates	✓		✓	EM, SD - Define, demonstrate and compare the structures of different systems such as, integumentary, skeletal, digestive, respiratory, circulatory, urinogenital, nervous and sensory organs in the vertebrate groups.
UGZOCC 09	Animal physiology: Life sustaining systems	✓	✓	✓	EM, EN, SD - Compare and analyse the histology of different tissue, determine ABO Blood group, and examine red blood cells, white blood, haemoglobin and blood pressure
UGZOCC 10	Biochemistry of metabolic processes	✓	✓	✓	EM, EN, SD - Estimate total protein and evaluate SGOT and SGPT or GST and GSH in serum/ tissue.
UGZOCC 11	Molecular biology	✓	✓	✓	EM - Prepare bacterial culture and examine bacterial growth. EN - Demonstrate and apply various molecular tools and techniques like PCR, southern, northern and western blotting, recombinant DNA technology etc. SD - Elaborate various tools and techniques related to bacterial microbiology and apply some aspects of applied microbiology and diseases related to microbiology.
UGZOCC 12	PRINCIPLES OF GENETICS	✓		✓	EM, SD - Illustrate and compare various aspects of human genetics by covering chromosomal aberrations, gene mutation, etc..
UGZOCC 13	Developmental biology	✓	✓	✓	EM, EN, SD - Apply and adapt the knowledge of developmental biology in various fields, such as in teratogenesis, stem cell biology, in vitro fertilization, cryopreservation, cord blood transfusion etc.

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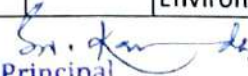


Course code	Title of the Course	Activities			Remarks
		Employability	Entrepreneurship	Skill development	
UGZOCC14	Evolutionary biology	✓		✓	EM, SD - Explain the population genetics and evaluate the evolutionary forces and its impact.
UGZOODS E_1	Immunology	✓	✓	✓	EM, EN, SD - Understand and identify the histology of spleen, thymus and lymph nodes and analyse the bloodcells, blood groups and immune reactions
UGZOODS E_2A	Animal behaviour and chronobiology	✓		✓	EM, SD - Compare nesting habits of animals, analyse the ethogram and prepare a short report on behavioural activities of animals
UGZOODS E_2B	Pollination biology	✓	✓	✓	EM, EN - Illustrate and evaluate the basic principle and modes of pollination, types and identification of flower visitors, pollinator diseases, colour vision capabilities of insect pollinators. SD - Evaluate and prepare report on the relationship between the flowering plants and mouthparts of the pollinating insects
UGZOODS E_2C	Project work	✓		✓	EM - Apply various bioinformatics tools, analyse and interpret various biological data. SD - Identify research questions and design insilico experiments
UGZOODS E_3	Biodiversity and wild life conservation	✓		✓	EM - Understand and apply the various tools used in field biology SD - Prepare complete report on excursion or field visit.
UGZOODS E_4	Computational biology	✓		✓	EM - Illustrate, inspect and apply the biological databases to retrieve biological data SD - Demonstrate and apply the tools in bioinformatics and biostatistics
UGZOOGE 1	Animal diversity and systems			✓	SD - Define, demonstrate and illustrate the basic endocrinology and histology of animals.

  
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Course code	Title of the Course	Activities			Remarks
		Employability	Entrepreneurship	Skill development	
UGZOOGE 2	Ecology, economic and medical zoology	✓	✓	✓	EM - Illustrate, analyse and evaluate the concept of ecology, biodiversity and wildlife conservation. EN - Define, demonstrate and apply the concept of parasitism and evaluate the life history, pathogenicity and clinical features of selected parasites. SD - Define and understand the basic principles of biotechnology and immunology.
UGZOOGE 3	Biotechnology: microbes to animals	✓	✓	✓	EM - Demonstrate and evaluate the application of microbes in biotechnology EN, SD - Extend the basic concept in biotechnology and human welfare and perform experiments.
UGZOOGE 4	Insect, vectors and diseases	✓	✓	✓	EM, EN, SD - Demonstrate, identify and prepare report on different vectors and their associated diseases.
UGZOOSE C_1	Value education & indian culture	✓		✓	EM, SD - Understand the relation: Values and enlightened citizenship. Explain and analyse the idea about Modern India: her hopes, challenges and Swami Vivekananda
UGZOOSE C_2	Spoken Tutorial from IIT Bombay	✓		✓	EM, SD - Build gene-regulatory and biochemical networks by CellDesigner, a structured diagram editor. Design models of biochemical reaction networks in Computer-readable format.
UGZOOAE CC 01	English	✓		✓	EM, SD - Apply the requisite communicative skills and strategies to future careers. Gain an insight into cultural literacy and cross-cultural awareness and engage in self-directed English language learning
UGZOOAE CC 02	Environmental Science	✓		✓	EM - Illustrate and apply the knowledge about the social, environmental issues and environmental legislation. SD - Define, demonstrate and evaluate the impact of human population on the Environment

  
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**Programme Code: PGZOO, Programme name: M.Sc. Zoology**

Sl. No.	Course code	Title of the Course	Activities			Remarks (EM - Employability, EN - Entrepreneurship, SD - Skill development)
			Employability	Entrepreneurship	Skill development	
1	PGZOCC 1.1T	Diversity and biology of Nonchordates	✓		✓	EM - apply the biological and medicinal importance of various larvae and sponges respectively. SD - Acquire skills in teaching the structural and functional features of invertebrate animal life's diversity.
2	PGZOCC 1.2T	Diversity and biology of Chordates			✓	SD - Demonstrate, analyse and discuss structural adaptation of different vertebrates.
3	PGZOCC 1.3T	Cell biology & Instrumentations	✓	✓	✓	EM - Acquire and apply various knowledge on tools and techniques in cell biology. EN - Apply various knowledge on instrumentation to a start up diagnostic lab in cell biology. SD - Explain and apply centrifugation, spectrophotometry, electrophoresis & blotting and microscopy.
4	PGZOCC 1.4T	Genetics			✓	SD - Demonstrate, analyse and apply the concept of crossing over & linkage to construct gene map.
5	PGZOCC 1.5P	Structures & systems of organisms	✓		✓	EM - Demonstrate and apply the knowledge of hypophysation technique. SD - Acquire, apply and evaluate knowledge on aquaculture firm operation.
6	PGZOCC 1.6P	Tools & techniques in biological study	✓	✓	✓	EM - Analyse the adulteration and estimate the insulin applying the knowledge on HPLC and ELISA respectively EN - Apply various knowledge on instrumentation to a start up diagnostic lab in biochemistry. SD - Apply the knowledge on preparation, purification and gel electrophoresis of DNA

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			Employability	Entrepreneurship	Skill development	
7	PGZOOSOC 1	Yoga			✓	SD - Understand and improve the decision-making capacity, build up confidence in their life
8	PGZOCC 2.1T	Biochemistry & Metabolism	✓	✓	✓	EM - Understand, apply and discuss the synthesis of fatty acids and nucleic acids EN - Apply various knowledge on instrumentation to a start up diagnostic lab in bichemistry. SD - Demonstrate, evaluate and analyse the different metabolic pathways
9	PGZOCC 2.2T	Molecular biology & Biotechnology	✓	✓	✓	EM - Understand and apply the gene regulation, gene silencing and non-coding RNAs interference for drug development EN - Apply various knowledge on Molecular biology and Biotechnology to set a start up biotech farm SD - Explain, adapt and apply different genetic engineering tools
10	PGZOCC 2.3T	Ethology & chronobiology	✓	✓	✓	EM -Understand and apply the animal's communications system in resource exploration and discuss the significance EN - Apply various knowledge on resource exploration to set up animal husbandary SD - Define, Understand and analyse the various types of social organization in animals
11	PGZOCC 2.4T	Ecological sciences	✓	✓	✓	EM - Understand, apply and formulate the riverine and wetland ecosystem management EN - Apply various knowledge on ecosystem and envirnmental to provide consultancy service SD - Demonstrate, analyse and design models in the population and community ecology

  
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			Employability	Entrepreneurship	Skill development	
12	PGZOCC 2.5P	Biochemical and molecular aspects of life	✓	✓	✓	EM - Apply the knowledge of cell culture lab protocols EN - Apply various knowledge on molecular biology to a start up diagnostic lab in cell biology. SD - Identify, analyse and solve DNA sequence
13	PGZOCC 2.6P	Ethology & Ecology	✓	✓	✓	EM - Perform toxicity test, physicochemical parameters of water and soil EN - Apply various knowledge on ecosystem and environmental to provide consultancy service SD - Apply, analyse and adapt the knowledge of population ecology to solve ecological problems
14	PGZOCC 2	Communicative English	✓		✓	EM - Enhance their English language proficiency in the aspects of reading, writing, listening and speaking SD - Apply the requisite communicative skills and strategies to future careers
15	PGZOCC 3.1T	Parasitology and Immunology	✓		✓	EM - Remember, explain and analyse the parasites detection, diagnosis, prophylaxis and host parasite interactions SD - Explain and apply the knowledge on immunological mechanisms of infectious and noncommunicable disease formation
16	PGZOCC 3.2T	Developmental biology and Neurobiology			✓	SD - Demonstrate the brain aging and various neuropathological diseases
17	PGZOCC 3.3T	Endocrine physiology			✓	SD - Illustrate and discuss the reproductive disorders endocrine disruptions

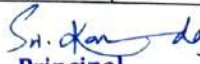
  
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			Employability	Entrepreneurship	Skill development	
18	PGZOOEC 3.4T-1A	Elective paper - Entomology	✓		✓	EM - Demonstrate, evaluate, and discuss the application of social insects SD - Attain a solid foundation in insect biology, including general entomology, basic systematics, morphology, physiology, and biodiversity
19	PGZOOEC 3.4T-2A	Elective paper- Cellular and Molecular Biology	✓	✓	✓	EM - Demonstrate, apply and elaborate the role of various enzymes in disease formation and disease diagnosis EN - Apply various knowledge on genetic engineering to set a start up biotech farm SD - Understand and elaborate the application of tools for genetic engineering
20	PGZOOCC 3.5P	Immunology, Parasitology, Developmental biology & Endocrinology	✓	✓	✓	EM - Apply the knowledge of preparation of stains, fixatives, culture media for parasites, and their spot identifications and blood smear examination EN - Apply various knowledge on histology and immunology to set a start up diagnostic lab SD - Demonstrate and apply the knowledge of preparation of stains, fixatives, culture media for parasites, and their spot identifications and blood smear examination
21	PGZOOEC 3.6P-1A	Dissertation and practical of elective paper - Entomology	✓		✓	EM - Demonstrate, analyse and apply the knowledge of Collection, Preservation, Curation, Identification and Classification of Major Insect Orders SD - Design and perform original research work in Entomology

*Su. Kanungo*  
Principal

Ramakrishna Mission  
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Rahara, Kolkata-700 110.

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			Employability	Entrepreneurship	Skill development	
22	PGZOOEC 3.6P-2A	Dissertation and practical of elective paper - Cellular and Molecular Biology	✓	✓	✓	EM - Demonstrate and perform bacterial culture and plasmid DNA preparation EN - Apply various knowledge on molecular diagnostic to set a start up diagnostic lab SD - Demonstrate, and apply the knowledge of DNA and protein isolation and evaluate the DNA quality through visualization
23	PGZOOSOC 3	Value Education and Indian Culture	✓		✓	EM - Define, understand and apply the daily routine, self-evaluation & Integral Personality Development SD - Demonstrate and practice the Four Yogas
24	PGZOOCC 4.1T	Taxonomy and Biostatistics	✓		✓	EM - Demonstrates, analyse and apply the descriptive statistics and construct skills in diagrammatic representations SD - Apply various sampling techniques and statistical inference to solve various problems
25	PGZOOCC 4.2T	Bioinformatics and Computational Biology	✓		✓	EM - Analyses nucleotide and protein sequences using various databases and software tools SD - Evaluate RNA interference and RNA regulatory networks. Predict gene, ORF, protein structure and their functional role.
26	PGZOOCC 4.3T	Bio python and LaTeX	✓		✓	EM - Organize documents into different sections, subsections, etc., Formatting pages, Formatting text, create presentations using Beamer SD - Learn, evaluate and apply the handling and analysis of nucleotide, protein sequences and databases.

  
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			Employability	Entrepreneurship	Skill development	
27	PGZOOEC 4.4T -1B	Elective paper - Entomology	✓	✓	✓	EM - Apply the insect biology and its diversity in the field of agriculture, forest ecology, vector biology and forensic science EN - Apply the knowledge of insect biology in apiculture, sericulture, and lac culture SD - Understand, access and apply the insect diversity in environment monitoring and the global environmental impact on insects
28	PGZOOEC 4.4T -2B	Elective paper - Cellular and Molecular Biology	✓	✓	✓	EM - Remember, understand and apply the gene transfer and gene manipulation methodologies in biotechnology EN - apply the tools and techniques in molecular biology viz. PCR, Cloning SD - Understand, analyse and apply various nucleotide sequencing techniques
29	PGZOOCC 4.5P	Phylogenetics, Biostatistics and Bioinformatics	✓		✓	EM - Demonstrate and apply the Basics operations in R, data Visualization with R and construct graph SD - Demonstrate and apply the python for bioinformatic analysis
30	PGZOOEC 4.6P -1B	Submission of final dissertation and practical of elective paper Entomology	✓	✓	✓	EM - Demonstrate and evaluate the knowledge of morphology of typical insects under different orders EN - Apply the knowledge of insect biology in apiculture, sericulture, and lac culture SD - Design, examine and interpret original research work in Entomology

*Sri. K. M. Das*  
Principal

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			Employability	Entrepreneurship	Skill development	
31	PGZOOEC 4.6P -2B	Submission of final dissertation and practical of elective paper - Cellular and Molecular Biology	✓	✓	✓	EM - Apply the knowledge of DNA barcoding, cloning and sequencing EN - EN - apply the tools and techniques in molecular biology viz. PCR, Cloning, barcoding, cloning and sequencing SD - Design, examine and interpret original research work using molecular biology techniques
32	PGZOOSOC 4	Fundamentals of remote sensing and GIS	✓		✓	EM - Understand and evaluate the basics of GIS and remote sensing and its application SD - Demonstration and apply the basic Map preparation in ArcGIS

*S.H. Karmada*  
Principal

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# Computer Science

## Employability / Entrepreneurship / Skill development

Course Code	Title of the Course	Semester	Activities			Remarks
			Employability	Entrepreneurship	Skill development	
UGCMS CC 1	Programming Fundamentals using C/C++; Theory & Lab	I	✓	✓	✓	This course will provide the logical and conceptual knowledge of computer programming for application development with hands-on practical training which is skill based and will provide employability in MNCs. This will enable the independent thinking towards Entrepreneurship
UGCMS CC 2	Computer System Architecture: Theory & Lab	I	✓	✓	✓	It will provide the architectural details and knowledge with hands-on experiments of basic computer hardware which is skill based and will provide employability in MNCs. This knowledge may be used for Entrepreneurship.
UGCMS CC 3	Programming in JAVA: Theory & Lab	II	✓	✓	✓	It will provide the object oriented advanced logical and conceptual understanding of computer programming using Java for application development with hands-on practical training which is skill based and will provide employability in MNCs. This will enable the independent thinking towards entrepreneurship
UGCMS CC 4	Discrete Structures: Theory & Tutorial	II	✓	✓	✓	This will create the skill of discrete mathematical analysis of computing methods and logical operations of computing systems which will be helpful in employability and entrepreneurship
UGCMS CC 5	Data Structures: Theory & Lab	III	✓	✓	✓	It will provide the knowledge of structural and logical organisation of data in a computing system, is a skill essential for getting jobs in computer related fields and also for entrepreneurship
UGCMS CC 6	Operating Systems: Theory & Lab	III	✓	✓	✓	This will give the knowledge of functionality and design aspects of operating system of any computing system, is a skill essential for getting jobs in computer related fields and also for entrepreneurship
UGCMS CC 7	Computer Networks: Theory & Lab	III	✓	✓	✓	It will give the understanding of the principals and functionalities of networking system, enhance the skills and capabilities of entrepreneurship which intern helps in employability
UGCMS SEC 1	Value Education	III	✓	✓		This is helpful to enrich human values and social ethics which will be helpful as an entrepreneur and also increases the chances of employability
UGCMS CC 8	Design and Analysis of Algorithms: Theory & Lab	IV	✓	✓	✓	It is helpful to understand the design aspects of algorithms and computational cost of algorithms for efficient development of softwares. This skill is highly necessary for employability and entrepreneurship

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Course Code	Title of the Course	Semester	Activities			Remarks
			Employability	Entrepreneurship	Skill development	
UGCMS CC 9	Software Engineering: Theory & Lab	IV	✓	✓	✓	This will incorporate the basic skills of systematic software development which is the key aspect of software design in MNCs, thus highly necessary for employability and entrepreneurship
UGCMS CC 10	Database Management Systems: Theory & Lab	IV	✓	✓	✓	This will create the skill of structural and logical organisation of database system to efficiently handle large amount of information which will be helpful for employability and entrepreneurship
UGCMS SEC 2	Programming in Python	IV	✓	✓	✓	It will provide the object oriented concepts of computer programming using Python for application development which is skill based and will provide employability in MNCs. This will enable the independent thinking towards entrepreneurship
UGCMS CC 11	Internet Technologies: Theory & Lab	V	✓	✓	✓	This skill will be helpful to accure the base knowledge of functionality and design aspects of Internet along with technologies used to run the same. It is essential for getting jobs and also for entrepreneurship
UGCMS CC 12	Theory of Computation: Theory & Tutorial	V	✓	✓		This will provide the understanding of the basic underlined structural and logical aspects of computational behaviours in different states of cognitive reasoning which is needed for employability and entrepreneurship
UGCMS DSE 1	Microprocessor: Theory & Lab	V		✓	✓	It will provide the knowledge about the architectural details and functionality of processor with hands-on experiments, this skill is helpful for entrepreneurship
UGCMS DES 2	Numerical Methods: Theory & Lab	V	✓		✓	This will provide the knowledge of methemetical methods and computing mechanisms with hands-on practicals, is a skill needed for emploability.
UGCMS DES 3	Cloud Computing: Theory & Lab	V	✓	✓	✓	This skill is required to get the base knowledge of recent technologies of cloud based computing methods and functionalities which is essential for getting jobs and also for entrepreneurship
UGCMS CC 13	Artificial Intelligence: Theory & Lab	VI	✓	✓	✓	One of the most important skills to have for employability and entrepreneurship which will provide the understanding of the basics concept and recent developments of Artificial Intelligence algorithms with hands-on practical training
UGCMS CC 14	Computer Graphics: Theory & Lab	VI	✓	✓	✓	It will provide the basic concept of graphical representation of computing outcomes along with graphical user interfaces, methods, applications and developments, is a skill needed for emploability and entrepreneurship

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Course Code	Title of the Course	Semester	Activities			Remarks
			Employability	Entrepreneurship	Skill development	
UGCMS DSE 4	Machine Learning: Theory & Lab	VI	✓	✓	✓	In current time, one of the most important skills to have for employability and entrepreneurship which will provide the understanding of the basics concept and recent developments of Machine Learning algorithms with hands-on practical training
UGCMS DSE 5	Data Mining: Theory & Lab	VI	✓	✓	✓	In current time, one of the most important skills to have for employability and entrepreneurship which will provide the understanding of the basics concept and implementation of different Machine Learning algorithms to handle varieties of data with hands-on practical training
UGCMS DSE 6	Dissertation or Project work	VI	✓	✓	✓	This is one of the important skill needed for employability and entrepreneurship as it enable students to take the responsibility to complete a research oriented challenging task inside a given time frame and to work in a collaborative environment

  
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