C Seetoon

M.Phil., in Biotechnology
Syllabus and Regulations

M.Phil - Bio

PROCEEDINGS OF THE REGISTRAR,
TAMIL NADU VETERINARY AND ANIMAL SCIENCES UNIVERSITY
MADHAVARAM MILK COLONY, CHENNAI-600 051.

PRESENT: DR.V.THIAGARAJAN, Ph.D.,
REGISTRAR.

U.S.O.No.40039/E1/2005 Dated 28.7.2005
(No.20089/E1/2003)

Sub: Education – TANUVAS – Academic Regulations for M.Phil course in Biotechnology under semester pattern – approved – Regarding.

Ref; U.O.No.60030/R.I/Spl./BOM/55-2005, No.10345/R.I/Spl. BOM/55-3/40-7/2005, dt: 30.6.2005 of the Registrar, TANUVAS, Chennai-51.

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ORDER:

The Board of Management in its fifty fifth special meeting held on 8.6.2005 has approved the Academic Regulations for M.Phil course in Biotechnology under semester pattern and to add the same as clause 31 (e) under chapter V of the Regulations of the University and accordingly orders are issued with the approval of the Vice-Chancellor, TANUVAS, as detailed in the Annexure.

2. The Dean, Madras Veterinary College, Chennai is requested to take necessary action in the matter.

REGISTRAR. 28/7/2005

29/7/05

Encl: As above.

To

The Dean, Madras Veterinary College, Chennai-7.
Copy to Section 'C' in Registrar's Office, TANUVAS.
Copy to Section 'R' in Registrar's Officer, TANUVAS.

TAMIL NADU VETERINARY AND ANIMAL SCIENCES UNIVERSITY

U.O.No.60030/R.1/Spl.BOM-55/05
No.10345/R.1/Spl.BOM-55-3/40-7/2005

Office of the Registrar,
Madhavaram Milk Colony, Chennai-51

Dated: 30.6.2005

PROCEEDINGS

Sub: Tamil Nadu Veterinary and Animal Sciences University {TANUVAS} – Board of Management – 55th Special Meeting held on 8.6.2005 – Academic Regulations for M.Phil Course in Biotechnology under Semester pattern – Approved – Orders – Issued.

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ORDER:

The Board of Management in its Fifty fifth Special Meeting held on 8.6.2005 considered the recommendation of the Fortieth Meeting of the Academic Council held on 8.6.2005 and approved the Academic Regulations for M.Phil Course in Bio-technology under Semester pattern as detailed in the Annexure and to add the same as Clause 31(e) under Chapter V of the Regulations of the University.

2) Sections 'C' and 'R' shall take necessary action in the matter.

/BY ORDER OF THE VICE-CHANCELLOR/

REGISTRAR.

Encl: Annexure.

To
Section 'C', Registrar's Office, TANUVAS.
Section 'R', Registrar's Office, TANUVAS.
cc: Section 'E', Registrar's Office, TANUVAS.
cc: Stock file/USO file/Spare-2.

ANNEXURE

REGULATIONS FOR M. PHIL COURSE IN BIOTECHNOLOGY
(Under Semester pattern)

1. REQUIREMENTS

a. Residential

A minimum of two semesters for M.Phil course in Biotechnology including writing, and submission of dissertation. However, a maximum of four semesters may be allowed under special circumstances from date of admission. If any student leaves the college with the prior permission from the Faculty Dean, after completing one semester of study for reasons beyond his/her control, shall be permitted to rejoin within 3rd/ 4th semester after obtaining prior approval of the University. However, the student shall complete his/her degree requirement within maximum duration of 4 semesters.

b. Credit

A student enrolled for M.Phil course shall be required to complete 36 credits inclusive of 20 of credits of course work and 15 credits for the dissertation work and one credit for seminar to earn eligibility for the M.Phil degree.

The candidate should also satisfactorily completes the final viva-voce examination covering course work and dissertation with minimum cumulative grade point average of 7.5 on a 10 point scale, ie. the overall GPA (OGPA) should be equal to or above 7.5 out of 10.0.

2. ATTENDANCE

a. Every student shall ordinarily attend all the classes in a course. However, a minimum attendance prescribed in a course shall be 80% for theory and practical separately. Those who have absented because of illness/academic purpose/extra curricular activities/ deputation shall apply for condonation of shortage of attendance upto a maximum of 10% to the Faculty Dean. Such of those students not satisfying the attendance shall repeat the course and complete the same as and when offered.

b. A student admitted to the first semester when fails to register for the courses or having registered but failed to put in the minimum attendance requirement for M.Phil. course shall forfeit his/her admission, provided no prior permission is obtained from the Faculty Dean of the College. However, on seeking readmission he/she has to undergo the normal admission procedure as a fresh..

3. ADVISORY COMMITTEE

a. Each M.Phil course student shall have an Advisory Committee to guide the student in carrying out his/her programme. The Head of the Department shall constitute the Advisory Committee and get the approval from the Faculty Dean. The Advisory Committee shall consists of 2 members including Chairman. The member shall be from within or outside the Department. The Advisory Committee shall guide the student in the selection of research problem and all other matters related to academic activities. The Chairman of Advisory Committee is responsible for the academic programme of the candidate including selection of the topic for dissertation work. However, the Professor and Head will coordinate for the successful completion of the programme.

b. Proposal for the formation of Advisory Committee in the proforma shall be submitted to the Faculty Dean within 45 days from the date of commencement of first semester. After the approval of the Advisory Committee, the programme of course work and programme of research in the proforma prescribed shall be submitted before the end of the first semester.

c. A reconginzed PG teacher shall be permitted to be a Chairman / Member in not more than 3 Advisory Committees of M.Phil students at any one time. This would be over and above the M.V.Sc/Ph.D guidance/Member limit of 3/3 students at any one time prescribed by the University.

d. The Advisory Committee shall discharge the following duties in addition to 3 (a) :

   i. To draw out the programme of studies for the students
   ii. Evaluation of research credits.
   iii. Conduct of final viva-voce examination

e. Whenever the Chairman or a member of the Advisory Committee happens to be away from his/her duties for more than one semester due to deputation/retirement/other reasons, the Head of the Department should report the fact immediately to the Faculty Dean for substitute arrangement. The newly assigned Chairman/Member shall continue even after the return of the previous Chairman/Member. The revision of the Advisory Committee shall be vested with the Faculty Dean based on the recommendations of the concerned Head of the Department.

f. In each department, the Professor and Head is required to update the list of Postgraduate teachers and guides, as and when the staff acquire the minimum qualification to become the Postgraduate teachers and guides.

4. PERMISSIBLE CREDIT LOAD

Maximum permissible work load per Semester

M. Phil	Full time
Course credit	20
Seminar and Research credit	16

There is no part time in M.Phil (Biotechnology) programme. Under special circumstances student shall be permitted to have one or two extra credits. In such case, the total credit registered will be taken into account to calculate OGPA.

5. EXAMINATION AND EVALUATION

All students shall abide by the regulations of the University prescribed from time to time for evaluating their performance under the semester system of education.

a. Semester Examination

During the semester, the course teacher shall assign specific work and conduct test for internal evaluation (Midterm and Term paper). The test conducted for internal evaluation shall include objective and subjective type of questions.

The mid term examination shall be of two hours duration and question paper pattern may include :

i. Define / Explain (10 x 2 = 20)
ii. Write short notes on any four (4 x 5 =20)
iii. Essay on any two (2 x 20 = 40)
Total = 80 marks

The total marks secured by the student in the Mid term examination will be converted into 20 and included in the final grade.

The distribution of marks for the examination shall be as follows :

			Maximum Marks
Theory 100	i.	Mid term test	20
	ii.	Term paper	10
	iii.	Final exam	70
Practical 50	i.	Record	5
	ii.	Viva-voce	15
	iii.	Practical	30

a. A M.Phil student shall secure a minimum of 65% in theory and practical separately with the minimum aggregate of 70% for a pass. While calculating the G.P.A, the marks obtained for 150 shall be converted to 100 and divided by 10 for getting the grade point.

b. The course with theory alone shall have a maximum of 100 marks with similar distribution as given above. For courses having only practical the distribution of marks shall be double for each category total being 100.

c. The mid-term test for internal evaluation shall be conducted by the course teacher. The final written examination shall be the University examination and will be conducted in a common examination hall. The evaluation shall be carried out centrally by the examiners appointed by the University from among the subject teachers of the University. The practical examination shall be conducted locally by the course teacher.

d. Distribution of marks for Final theory examination of 2 hours duration :

i.	Explanation / Definition	10
ii.	Short notes	20
iii.	Essay type	40

e. It shall be the responsibility of the Head of the Department for the conduct of the examination in all the courses conducted by the Department. The Dean / Heads of Departments shall constantly exercise their responsibilities in that, the syllabus listed under each course is adequately covered and the assessment of the student is done strictly in accordance with the rules and regulations.

f. Students registering a particular course shall take all examination conducted during the course duration, both in theory and practical.

g. No condonation for the absence shall be given for any examinations under any circumstances. Students not taking examination for internal evaluation may take the final theory and practical and qualify for a pass if successful in satisfying the regulation (1) and (2).

h. M.Phil students getting a grade less than 7.0 in any course shall be deemed to have failed in that course. The failed students may be permitted to improve the grade by appearing a separate examination conducted along with regular semester examination of the subsequent semester by paying the fee of Rs.200/-per subject. The mark awarded for internal shall be carried over.

6. VIVA-VOCE

The Chairman of the Advisory Committee shall send a list of three experts to the University for recommendation. The dissertation would be sent to the identified external expert by the University and report obtained. The Chairman of the Advisory Committee shall act as Chairman of the examination committee also. The performance of the candidate may be evaluated as successful / unsuccessful. The results of the examination shall be communicated by the Chairman to the University through the Faculty Dean after getting approval from all the members of the committee. The final viva-voce would be conducted by the Advisory Committee taking into account the external experts comments / corrections/ suggestions, etc

7. DISSERTATION

a. The total pages for dissertation is to be restricted to a maximum of 50 pages exclusive of annexures etc., The dissertation should be of such a nature as to indicate the students potentialities for conducting research. The research shall be on a topic falling within the field of the major subjects and shall be the result of the independent work of the student.

b. The topic chosen and approved for the dissertation shall not be normally changed. However, under extraordinary circumstances the dissertation topic may be changed before completing 30 working days after registration of dissertation work credits on the recommendation of the Advisory Committee and approval of the Faculty Dean.

8. SUBMISSION OF THE DISSERTATION

The student shall submit the dissertation initially two soft bound copies on the last week of the final semester. Five copies of hard bound dissertation copies should be submitted after the final viva-voce examination.. However, under extraordinary circumstances the students will be permitted to submit the dissertation by paying late fee of Rs. 500/- and submit any time during the next semester.

9. EVALUATION

i. Normally the final viva-voce examination shall have to be conducted by the Advisory Committee with all its members. However, under extraordinary circumstances, in the absence of one member, the same may be conducted by the HOD / Staff nominated by HOD provided necessary prior permission is obtained from the Dean of the Faculty. In case, if the Chairman is not available due to official / personal reason, the Dean of Faculty can conduct the viva-voce examination along with other members.

ii. A report regarding the performance of the student in the final viva-voce examination on the dissertation in form prescribed shall duly be signed by the members of the Advisory Committee present and submitted to the University.

iii. In case of external examiner suggesting major modifications to be made in the dissertation, the same shall be communicated to the Chairman of the Advisory Committee who shall arrange for the revision of the dissertation and resubmission within a period of 15 days. A candidate shall not be permitted to submit his/her dissertation for the M.Phil more than two occasions and if the dissertation is not approved on the second occasion, the candidate shall not be awarded the M.Phil degree.

10. DECLARATION OF RESULTS :

The award of M.Phil degree for all the successful candidates will be based on the following guidelines :

O.G.P.A.	from 7.5 to 8.4	-	Second Class
	from 8.5 to 9.4	-	First Class
	from 9.5 and above	-	Distinction

REGISTRAR
Tamil Nadu Veterinary & Animal Sciences University
Madhavaram Milk Colony
CHENNAI-600 051.

4781

TAMIL NADU VETERINARY AND ANIMAL SCIENCES UNIVERSITY

U.O.No. 60140/R.I/BOM-50/2004
No.1774/R.I/BOM-50/6 -6/2004

Office of the Registrar,
Madhavaram Milk Colony, Chennai-51.

Dated: 5.3.2004

PROCEEDINGS

Sub: Tamil Nadu Veterinary and Animal Sciences University {TANUVAS} – Board of Management – Fiftieth Meeting held on 18.2.2004 – Starting of "M.Phil course in Biotechnology" in Basic Sciences faculty of Madras Veterinary College, Chennai and the Syllabus, Course contents, fee etc. for the Course during the Academic year 2004-05 – Approved – Orders – Issued.

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ORDER:

The Board of Management in its Fiftieth Meeting held on 18.2.2004 considered the recommendation of the 37th Meeting of the Academic Council held on 12.2.2004 and approved the starting of "M.Phil Course in Biotechnology" in Basic Sciences faculty of Madras Veterinary College, Chennai and the Syllabus, Course contents, fee etc. for the Course as detailed in the **annexure** during the Academic year 2004-05.

2) Section 'C' shall take necessary action in the matter.

/BY ORDER OF THE VICE-CHANCELLOR/

REGISTRAR.

Encl.: as above

To
Section 'C', Registrar's Office,TANUVAS. (duly numbered)
Cc: The Finance Officer, TANUVAS.
Cc: Section 'E', Registrar's Office,TANUVAS.
Cc: Stock File/U.S.O File/Spare-2.

ANNEXURE

SYLLABUS, COURSE CONTENTS, FEE STRUCTURE, INTAKE, STAFF STRENGTH ETC. FOR STARTING OF M.Phil COURSE IN BIOTECHNOLOGY

1. Duration of the course : Two semester (one year) semester consisting of 105 working days. Similar to PG programme in TANUVAS.

2. Syllabus, Course contents and :

3. Semester wise courses breakup details :

Course contents

The M. Phil degree would consist of two semesters: one semester of course work and the one semester of seminar, dissertation and viva voce.

Course Code	Title of the course	Core/Elective	Credit hours
FIRST SEMESTER			
MPB 101	Research Methodology and Scientific writing	Core	1 + 1
MPB 102	PCR and related techniques	Core	2 + 2
MPB 103	Recombinant DNA and Gene Cloning	Core	2 + 1
MPB 104	Immuno technology	Core	2 + 1
MPB 105	Cell culture and Hybridoma Technology	Core	2 + 1
MPB 106	Biotechnological methods in Animal Reproduction	Core	2 + 2
MPB 107	Introduction to Bioinformatics	Core	1 + 0
SECOND SEMESTER			
MPB 108	Seminar	Core	1 + 0
MPB 109	Dissertation and viva voce	Core	0+ 15

A candidate should register for 20 credits in the first semester consisting of seven core subjects. In the second semester, the candidate should deliver a seminar and do a dissertation work to a total of 16 credits

SYLLABI FOR THE M. Phil COURSES

MPB 101 Research Methodology and Scientific writing 1 + 1

Analytical techniques – Differential centrifugation – Density gradient and ultra centrifugation.

Chromatography – Affinity chromatography - Gel filtration chromatography
Electrophoresis – agarose gel electrophoresis – Trans illuminator Gel documentation - SDS-PAGE – Blotting techniques – Iso electric focussing
Spectrophotometry – UV VIS spectrophotometer, Beer Lambert's law Principles and applications of fluorimeter
Radio isotopes – measurement of radioactivity- scintillation counter – Autoradiograph - Non radioactive methods
Electron Microscopy
Introduction to scientific writing – Scientific paper – review paper – conference report – Oral and poster presentation

Practical
Differential centrifugation – Ultra centrifugation – Affinity chromatography – Agarose gel electrophoresis – SDS-PAGE – Spectrophotometer – DNA quantification - Protein estimation methods – Handling of radioisotopes – Chemiluminiscence.
Writing of scientific paper – preparations of posters – oral presentation – critical evaluation of a paper

MPB 102 PCR and other related techniques 2 + 2
Basic PCR – Different schemes of PCR - Inverse PCR- Anchored PCR – PCR for site directed mutagenesis – Asymmetric PCR Multiplex PCR - Competitive PCR – Real time PCR – RT-PCR – PCR walking- Applications of PCR in diagnosis
DNA - based molecular markers in Biotechnology - PCR-RFLP – RAPD- AFLP – Single nucleotide polymorphism - SSCP - Sequence tagged sites - Expressed sequence tags – Serial analysis of gene expression
Gene sequencing – Maxam and Gilbert's chemical method – Sanger's method – PCR sequencing – Sequencing strategies - Sequence analysis - Molecular epidemiology – Genome projects
DNA synthesis – Production of oligo nucleotide microarrays – production of cDNA microarrays – Application of DNA microarrays on DNA chips – Hybridization onto DNA Chips – DNA chips and functional genomics
Biosensors – Working principle – Applications of biosensors
Peptide nucleic acids – Applications of PNA – Double stranded RNA and RNA interference (RNAi).

Practical
Isolation of viral DNA – PCR
Isolation of RNA – Reverse transcription - RT-PCR
Restriction enzyme digestion – PCR-RFLP
RAPD
Multiplex PCR
Preparation of competitive construct - Competitive PCR
Sequencing gels – Automated sequencing
Analysis of sequences – Phylogenetic tree construction

MPB 103 Recombinant DNA and Gene Cloning 2 + 1

Restriction enzymes - Other DNA modifying enzymes and their uses in end labeling, nick translation, random primer labeling, dephosphorylation, phosphorylation, blunting, end filling etc.

Ligation – Construction of chimeric DNA - Preparation of competent cells – Chemical method – Transformation efficiency - Electroporation Transfection techniques
Cloning vectors – plamids, phages, Cosmids, Phagemids, BAC, PAC, YAC, MAC
Expression vectors - Viral, baculo and yeast vectors – Promoters – Expression cassettes
Construction of genomic and cDNA libraries - Screening of libraries - Nucleic acid probes – Preparation of probes – labeling of probes - Hybridization methods – Amplification of probe signal – Isolation of genes
Cloning and expression of PCR products Clone PCR

Practical
Isolation of DNA – Preparation of plasmid DNA – Restriction enzyme digestion – Ligation – Chemical Transformation – Calculation of transformation efficiency – Electroporation - Selection of recombinant clones Orientation of cloned insert PCR product cloning – Clone PCR

MPB 104 Immuno technology 2 + 1

Structure and classification of amino acids – Structure of proteins - Electrophoresis
Immunity – innate and acquired
Immunoglobulin – structure and function – classes and subclasses - isotyping – Diversity of imunoglobulins – Affinity maturation – Antigenic determinants on immunoglobulins
Antigens- Epitopes – Antigen processing and presentation
T-cells – MHC restriction - MHC polymorphism - TCR Effector functions of T-cells – Cytokines - CTL killing
New Generation vaccines - Immune responses to different types of vaccines – Immune modulation – adjuvants
Immunological techniques ELISA - indirect, sandwich and competitive ELISAs - Validation of immunoassays - PAGE – Western blotting Immuno chromatographic tests
Antibody engineering - Flow cytometry

Practical
Separation of mononuclear cells from blood lymphoproliferation Fluorescent assays - immunoperoxidase assays Latex agglutination tests - indirect ELISA - competitive ELISA – sandwich ELISA PAGE Western blotting Flow through tests - lateral flow tests - Flow cytometry

MPB 103 Recombinant DNA and Gene Cloning 2 + 1

Restriction enzymes - Other DNA modifying enzymes and their uses in end labeling, nick translation, random primer labeling, dephosphorylation, phosphorylation, blunting, end filling etc.

Ligation – Construction of chimeric DNA - Preparation of competent cells – Chemical method – Transformation efficiency - Electroporation Transfection techniques
Cloning vectors – plamids, phages, Cosmids, Phagemids, BAC, PAC, YAC, MAC
Expression vectors - Viral, baculo and yeast vectors - Promoters – Expression cassettes
Construction of genomic and cDNA libraries - Screening of libraries - Nucleic acid probes – Preparation of probes – labeling of probes - Hybridization methods – Amplification of probe signal – Isolation of genes
Cloning and expression of PCR products Clone PCR

Practical
Isolation of DNA – Preparation of plasmid DNA – Restriction enzyme digestion - Ligation – Chemical Transformation - Calculation of transformation efficiency – Electroporation - Selection of recombinant clones Orientation of cloned insert PCR product cloning – Clone PCR

MPB 104 Immuno technology 2 + 1

Structure and classification of amino acids – Structure of proteins - Electrophoresis
Immunity – innate and acquired
Immunoglobulin – structure and function – classes and subclasses - isotyping – Diversity of immunoglobulins – Affinity maturation – Antigenic determinants on immunoglobulins
Antigens- Epitopes – Antigen processing and presentation
T-cells – MHC restriction - MHC polymorphism - TCR Effector functions of T-cells – Cytokines - CTL killing
New Generation vaccines - Immune responses to different types of vaccines – Immune modulation – adjuvants
Immunological techniques ELISA - indirect, sandwich and competitive ELISAs - Validation of immunoassays - PAGE – Western blotting Immuno chromatographic tests
Antibody engineering - Flow cytometry

Practical
Separation of mononuclear cells from blood lymphoproliferation Fluorescent assays - immunoperoxidase assays Latex agglutination tests - indirect ELISA – competitive ELISA – sandwich ELISA PAGE Western blotting Flow through tests - lateral flow tests - Flow cytometry

MPB 105 Cell culture and Hybridoma Technology 2 + 1

Types of cells – morphology, cell membrane, cell growth cycle- differentiation and transformation – *In vitro* cell propagation – organ cultures – cell cultures – established cell lines – Disintegration of cells from tissue and monolayers – suspension cultures – cell preservation – cell counting – karyotyping of cells Roller culture fermenter cultures.

Hybridoma technique – Monoclonal antibody – merits and demerits - production and characterization – Screening assays - Uses of MAbs in Diagnostic, Research and Therapeutic application – Ascites production -- alternatives to ascites.

Practical

Primary cell culture – chicken embryo fibroblast culture - Maintenance of cell lines – Vero and BHK cell lines - Organ cultures - Cell counting - Karyotyping - Roller culture Virus growth – cytopathic effect

Monoclonal antibody production – preparation of spleen cells - maintenance of myeloma cells – fusion – screening of hybridomas – subcloning – Preparation of monoclonal antibodies

MPB 106 Biotechnological techniques in Animal reproduction 2 + 2

Collection of oocytes from slaughter house – grading - *in vitro* maturation – *in vitro* fertilization – Embryo culture - Embryo preservation Embryo sexing – Embryo transfer – Ovum pick up

Transgenic animal production – Gene transfer through embryos - Preparation of transgene construct – reporter molecules – GFP site specific expression - Identification of transgenes – PCR and Southern blotting

Cloning of Animals – Nuclear transfer – Cloning from embryonic cells, adult and fetal cells – Cloning for conservation

Gene knock out animals – production – Applications as models for human diseases

Stem cell culture – potential and applications

Practical

Collection of oocyes – grading – in vitro maturation – sperm collection methods – sperm capacitation – in vitro fertilization – Embryo culture – embryo freezing – embryo sexing

Preparation of GFP - Microinjection in to the embryo - Fluorescence

Isolation of DNA from tail tip – PCR for detection of transgene

Stem cells – Isolation and identification

MPB 107 Introduction to Bioinformatics 1 + 0

History of bioinformatics – Web services as bioinformatics tools – Alignment tools – Multiple sequence alignments – Phylogeny – Gene finders - Design of PCR primers – EST clustering packages – Bioinformatics data bases - Submission of sequences to Gen Bank – DNASTAR sequence package – Data mining – modelling - Genomics and proteomics.

MPB 110 Seminar 1 + 0

The seminar should be on any contemporary topic enabling the candidate to learn about the new area, its potential, its applications in their area of research and may be alien to their research topic.

MPB 111 Dissertation and viva voce 0 + 15

The candidate should undertake a dissertation with a guide identified by the Dean, Faculty of Basic Sciences and one another committee member within /outside the Department. The topic selected should involve new research techniques and the objective of the dissertation is to make the candidate do a few techniques on their own, obtain results and conclude from their results.

4. **Examination Pattern** : Theory : 100 marks
Practical : 50 marks

Theory = 100 marks	:	1. Mid test	: 20 marks
		2. Term paper	: 10 marks
		3. Final Exam	: 70 marks
		Total	: 100 marks
Practical = 50 marks	:	1. Record	: 5 marks
		2. Viva-voce	: 15 marks
		3. Practical	: 30 marks
		Total	: 50 marks

The grade point average (GPA) will be calculated by converting the marks obtained for 150 into for 100. The marks calculated to 100 will be divided by 10 to get GPA. The minimum G.P.A. for a pass would be 7.00 out of 10.

The examination pattern followed for M.V.Sc programme in TANUVAS will be followed for M.Phil in Biotechnology.

5. **Eligibility criteria** :

A candidate with Master's degree in Science in the disciplines of Biotechnology, Molecular biology, Gene Technology, Animal Biotechnology, Biochemistry, Microbiology, Zoology, Environmental Sciences, Genetics, Marine Biology and M.F.Sc from any other University accepted by the Academic Council of TANUVAS as equivalent there to shall appear and qualify for the M. Phil degree examination of this University.

A minimum of at least 60% marks or equivalent in OGPA in the respective PG degree would be eligible.

Admissions would be based on a written exam and interview to be held by TANUVAS.

6. **Fees structure** : Semester fee Rs.25,000/- each semester which includes examination and other fees.

7. **Proposed Intake strength** : SIX per year

8. **Availability of resource personnel** :

The teaching staff available in the department of Animal Biotechnology would be utilised and in addition one Associate Professor and one Assistant Professor post are required to conduct the M.Phil in Biotechnology.

9. **Additional Strength / facilities required** : Associate Professor – one
Assistant Professor – one
However, the additional staff need to be filled thro' deployment or by temporary contract assignments like guest lectures

Additional class room is required. The available laboratory facilities could be strengthened by providing extra laminar air flow and other accessories and equipments.

10. **Budget and any other requirement** :

Cost of personnel		Rs.
Associate Professor	(1)	2.50 lakhs per year
Assistant Professor	(1)	1.50 lakhs per year
Recurring		
Chemicals,Plastic wares etc.,		5.00 lakhs per year
Total		9.00 lakhs per year

11. **Period of project work and other relevant information as you may consider important** :

The project work will be undertaken in the second semester. The dissertation / thesis should be submitted at the end of second semester. The dissertation / thesis will be evaluated by an external examiner. A final viva voce will be conducted by the advisory / examining committee.

TAMIL NADU VETERINARY AND ANIMAL SCIENCES UNIVERSITY

USO.No.40094/E1/2006
No.41st Acad.council/Agenda Item No. 41:14

Office of the Registrar,
TANUVAS, Chennai-51.

Dated 6.4.2006

PROCEEDINGS

Sub: Education – TANUVAS – Revision of course credits and syllabus for M.Phil in Biotechnology – Approved – Regarding.

Ref: Minutes of the 41st Academic Council Meeting held on 24.2.2006.

***

The Academic council in its 41st Meeting held on 24.2.2006 has approved the recommendation of the XVI Board of studies Meeting (Faculty of Basic Sciences) held on 8.2.2006, regarding the revision of course credits and syllabus for M.Phil in Biotechnology along with the modification.

The revised course credits and syllabus will be implemented from the Academic year 2006-2007 onwards.

The Academic Council deferred the proposal for the reduction of fees from Rs.500/- to Rs.250/- for late submission of thesis.

The Dean, Faculty of Basic Sciences, Madras Veterinary College is requested to take necessary action in the matter.

REGISTRAR.

7/4/06

To

The Dean, Basic Science, Madras Veterinary College, Chennai-7.
Copy to 'C1 and C3' Section in Registrar's Office, TANUVAS, Chennai-51.

TAMIL NADU VETERINARY AND ANIMAL SCIENCES UNIVERSITY

U.O.No. 60028/R.I/BOM-57/2006
No.4244/R.I/BOM-57/3-2/41-14-16-2/2006

Office of the Registrar,
Madhavaram Milk Colony, Chennai-51.

Dated: 7.4.2006

PROCEEDINGS

Sub: Tamil Nadu Veterinary and Animal Sciences University {TANUVAS} – Board of Management – Fifty Seventh Meeting held on 22.3.2006 – Revision of Course Credits and Syllabus for M.Phil course in Biotechnology in the faculty of Basic Sciences – Approved – Orders – Issued.

-oOo-

ORDER:

The Board of Management in its Fifty Seventh Meeting held on 22.3.2006 considered the recommendation of the Academic Council in its 41st Meeting held on 24.2.2006 and approved the revision of the following Course credits and syllabus and the Regulations for M.Phil Course in Biotechnology in the Basic Sciences faculty:

COURSE CREDITS AND SYLLABUS:

MPB 102 – PCR AND OTHER RELATED TECHNIQUES (2+1)	
Theory	Same as existing
Practical	Isolation of viral DNA – PCR Isolation of RNA – Reverse transcription – RT-PCR Restriction enzyme digestion – PCR-RFLP RAPD Multiplex PCR – Real time PCR Analysis of sequences – Phylogenetic tree construction
MPB 101 – RESEARCH TECHNIQUES AND SCIENTIFIC WRITING (2+1)	
Theory	Analytical techniques-Differential centrifugation – Density gradient and ultra centrifugation. Chromatography–Affinity chromatography–Gel filtration chromatography. Electrophoresis – agarose gel electrophoresis–Trans illuminator – Gel documentation – SDS-PAGE - Blotting techniques – Iso electric focussing Spectrophotometer – UV VIS spectrophotometer, Beer Lambert's Law – Principles and application of fluorimeter Radio Isotopes – measurement of radioactivity – scintillation counter – Auto radiograph – Non radioactive methods Electron Microscopy Introduction to scientific writing – Scientific paper – review paper – conference report – Oral and poster presentation. Thesis writing – Introduction – Review of literature – Materials and methods – Results and Discussion – Bibliography – abstracts/summary Project proposal writing.
Practical	--

REGULATIONS:

Clause	Modified as
1(b)	Credit: A student enrolled for M.Phil course shall be required to complete 36 credits inclusive of 20 of credits of course work and 15 credits for the dissertation work and one credit for seminar to earn eligibility for the M.Phil degree.

..2..

Clause	Modified as
...	The candidates should also satisfactorily complete the final viva-voce examination covering course work and dissertation with minimum cumulative grade point average of 6.5 on a 10 point scale i.e. the overall GPA (OGPA) should be equal to or above 6.5 out of 10.0
5(a)(a)	A M.Phil student shall secure a minimum of 60% in theory and practical separately for a pass. While calculating the GPA, the marks obtained for 150 shall be converted to 100 and divided by 10 for getting the grade point.
5(a)(h)	M.Phil students getting less than 6.0 in any course shall be deemed to have failed in that course. The failed students may be permitted to improve the grade by appearing a separate examination conducted along with regular semester examination of the subsequent semester by paying the fee of Rs.200/- per subject. The mark awarded for internal shall be carried over.
8.	Submission of the Dissertation: The Student shall submit the dissertation initially two soft bound copies on the last week of the final semester. Five copies of hard bound dissertation copies should be submitted after the final viva-voce examination. However, under extraordinary circumstances the students will be permitted to submit the dissertation by paying late fee of Rs.500/- and submit any time during the next semester.
10.	The award of M.Phil degree for all the successful candidates will be based on the following guidelines: OGPA from 6.5 to 8.4 - Second Class 8.5 to 9.4 - First Class 9.5 & above - Distinction

2) Section 'C', Registrar's Office, TANUVAS shall take necessary action in the matter..

/BY ORDER OF THE VICE-CHANCELLOR/

REGISTRAR.

To

Section 'C', Registrar's Office, TANUVAS.

Cc: Section 'E', Registrar's Office, TANUVAS.

Cc: Stock File/U.S.O File/Spare-2.