参　考　資　料

TDC Road Map, Tourist Development Corporation, Ministry of Trade and Industry Malaysia, 1982.

A．　付　　録

附　録　一　（1）

付録(1)

AN APPLICATION TO THE GOVERNMENT OF JAPAN FOR TECHNICAL AID PROGRAMME TO DEVELOP THE FACULTY OF FISHERIES AND MARINE SCIENCE, JAN 1981 (REVISED 1983, DURING THE STUDY VISIT BY JICA TEAM - 13 - 27 AUGUST 1983).

Submitted

by

FACULTY OF FISHERIES AND MARINE SCIENCE
UNIVERSITI PERTANIAN MALAYSIA

AUGUST 1983

Introduction

This revised application to the Government of Japan for technical aid programme to develop the Faculty of Fisheries and Marine Science should be read as a supplement to the original document first submitted in Januari 1981.

The revision is necessasitated as a result of events that has taken place since the first request was made in 1981 (planning 1980). Among the events that prompted this revised request are:

(a) The time lapse of 2 - 3 years since the original request.

(b) New intake of staff and staff development programs from 1981 - 1983 has changed the faculty staffing position.

(c) The Development of the faculty has facilitated some changes in priorities as reflected in the revised request.

This revised document therefore reflect the most urgent needs of the faculty to meet objectives of training the manpower needs of the nation as well as the development of the Fisheries Sector in line with national aspirations.

This document will deal directly with the proposal for aid program corresponding with item 6 of the previous document.

1.0 Proposals for Aid Programme

Since the inception of aid request some 3 years has lapsed. During this period, the faculty development program continued along its charted course. Briefly these developments are in the areas of staff training, facilities academic programs and research. Several new staff has been recruited into the faculty and have been sent for further studies. Some staff sent overseas during the period has since return to strengthen the faculty position. These changes in the status is reflected in the this revised request for

training at the post graduate fellowship and short term fellowships.

The Faculty building is now completed and was occupied since June 1983. The fisheries research and training vessel is almost completed and handing over will be done by September 1983. The first batch of Bachelor Sciences (Fisheries) students graduated in August 1983. Clearly the Faculty of Fisheries and Marine Science is poised to take up greater challenges in research, extension and graduate study.

Such efforts however must necessarily be planned and supported by experienced personnel to assist and guide the faculty to ensure this critical stage is implemented to fruitful and long term success. Japanese success, experience and long tradition in fisheries education and research is world renowed. Japan would be therefore in the best position to make such a contribution.

This aid request to the Government of Japan will enable the Faculty of Fisheries and Marine Science UPM to develop its research, staff and teaching capabilities and enhance its overall capabilities as the only institution to support fishery education in Malaysia.

This aid request include post-graduate fellowship, short term fellowships, dispatch of experts and provision of equiptment as detailed below:

1.1 Post-graduate Fellowship (2-3 years)

These are intended to permit faculty members who have a basic degree to progress to M.Sc/Ph.D. Fellowships are requested in the following areas:

Areas	No.	Degree	Date
Fishing Gear Technology	1	M.Sc	1984
	1	Ph.D	1985
Fishing Methodology	1	M.Sc	1984
	1	Ph.D	1985

Areas	No.	Degree	Date
Fishing Technology	1	M.Sc	1985
	1	Ph.D	1986
Fishing Instrumentation	1	Ph.D	1986
Seamanship & Navigation	2	M.Sc	1984/85
Phycology	1	M.Sc	1984
	1	Ph.D	1987
Ichthyology	1	Ph.D	1984
Geological Oceanography	1	M.Sc	1984
	1	Ph.D	1986
Inverterbrate Culture	1	Ph.D	1985
Mariculture	1	Ph.D	1984
Fisheries Oceanography	1	M.Sc	1984
	1	Ph.D	1987
Population Dynamics	1	M.Sc	1985
Hatchery Management	1	Ph.D	1985
Marine Engineering	1	Ph.D	1986
Meteorology	1	M.Sc	1984
	1	Ph.D	1986
Chemical Oceanography	1	M.Sc	1985
	1	Ph.D	1987

1.2 Short-term Fellowships (3-9 months)

This type of training is requested to enable staff and technicians to acquire specialised skills through short-term attachment at an appropriate institutions in Japan. Training are required in the following fields.

Areas	No.	Level	Year
Fishing Gear Design	1	Academic	85
Fishing Gear Technology	1	Tech.	87
Fishing Gear Construction	1	Academic	86
Fishing Vessel Technology	1	Academic	88
Metreology	1	Academic	85
Fish Ocenography	1	Tech.	85
Population Dynamics	1	Academic	85
Fish Nutrition	1	Tech.	84

Areas	No.	Level	Year
Aquarium Management	1	Tech.	84
Mollusc Culture	1	Academic	86
Prawn Culture	1	Academic	85
	1	Tech.	87
Seaweed Culture	1	Academic	87
Fish Culture	1	Tech.	86
Marine Electronics	1	Academic	86
Electrophonesis Techniques	1	Tech.	87

Summary

Short Term Training

84	85	86	87	88	Total
2	5	4	5	1	17

1.3 Dispatch of Experts

This aid requested to assist with the development and teaching of undergraduate courses and the supervision of projects with graduate students. Local counterparts will be provided to understudy the experts and to take over the continued running of programmes initiated by the experts. Experts are required in the following areas of specialisation.

Areas	No. Post/Month	Year Required
Fishing Gear Technology	1 : 36	1984 - 1986
Navigation & Seamanship	1 : 24	1987 - 1988
Hatchery Management	1 : 24	1984 - 1985
Mariculture	1 : 36	1986 - 1988
Population Dynamics	1 : 24	1985/1987
Fisheries Oceanography	1 : 36	1984 - 1986
Fish/Prawn Disease	1 : 24	1987 - 1988
Fish Nutrition	1 : 36	1984 - 1986

Summary

84	85	86	87	88	Total
4	5	4	4	3	20 man years

1.4 Provision of Equipments

The equipments requested in this application are required to equip the laboratories and field facilities to meet the immediate needs for effective teaching and research activities of the Faculty.

1.4.1 Laboratory Equipments

	Cost	Year	Place
Liquid Scintillation counter (C^{14}, ^{32}p ^{3}H)	$150,000/-	83/84	Trengganu
Chromatograph (HPLC)	100,000/-	83/84	Serdang
Autoclave (Hospital Model)	50,000/-	83/84	Serdang
Research compound microscope x1	45,000/-	83/84	Serdang
Research inverted microscope x2	61,300/-	83/84) 1	Trengganu
Research zoom microscope x2	42,000/-	83/84) 1	+ Serdang
Constant voltage transformer x6 @ $4000/-	24,000/-	83/84) 2	Trengganu
		) 4	Serdang
Carbon analyser (infra red analyzer) x1	30,000/-	84/85	Serdang
Autoanalyser x1	60,000/-	84/85	Trengganu
Refrigerated circulator Unit x1	12,000/-	84/85	Serdang
Double beam atomic absorption spectrophotometer x1	100,000/-	84/85	Serdang
Automatic tissue processor x1	10,000/-	83/84	Serdang
Student compound microscope x30	50,000/-	1984)	Trengganu
Student stereozoom microscope x30	30,000/-	1984)	+ Serdang
Ultrasonic Vibrator x1	15,000/-	1984	Serdang
Salinity/conductivity/temperature meter	12,000/-	1984	Trengganu
Subtotal	$791,300/-		

1.4.2 Training research vessel equiptment

The construction of the above vessel has been completed and at present it us being fitted with the necessary

equipment. It us expected to be commissioned by the end of August 1983. However due to budget cut and increased cost of construction, several equipment had been omitted from the vessel. Request for equipments to be fitted on board is listed below:

1.	Portable echo sounders 2 - Demonstration/teaching 2 - Coastal Boat 1 - 15 tonner vessel $1000 x 5	$ 5,000
2.	Satelight navigator with track plotter	70,000
3.	Radio Communication set (Serdang & Trengganu) x2	15,000
4.	Echo sounder (color)	35,000
5.	Multibeam panoramic sonar	35,000
6.	Hydrographic winch	10,000
7.	Warp tension meter	20,000
8.	Net drum	40,000
9.	Refrigeration equiptment	10,000
	Subtotal	$240,000

1.4.3 Hatchery and Nutrition Equipments

Protein Analyzer x1	$ 30,000	84/85	Serdang
Fat Analyzer x1	30,000	"	"
Fibre Analyzer x1	30,000	"	"
Pelleting machine and accessories (to include steaming)	100,000	"	"
Feed grinder	10,000	"	"
Monotype Pump x1	30,000	"	"
Portable water pump x2	10,000	"	"
Fibreglass tanks (various size)	100,000	"	Serdang & Trengganu
Pressureed filter	30,000	"	Serdang

Diesel generator	40,000	84/85	Trengganu
Hauling truck for transporting live fish	10,000	"	Serdang
Analytical balance x1	4,000	"	Serdang
Icthyo plankton sampling gear	5,000	"	Trengganu
Subtotal	$429,000		

1.4.4 Photographic equipments

1.	Color Enlarger	$ 3,000	Serdang
2.	Underwater, Cine Camera 16mm	15,000	"
3.	Strobe lights	3,000	"
4.	Print dryers	2,000	"
5.	Trays, tongs, timers	2,000	"
6.	Photographic safety light and other facilities to complete dark room	10,000	"
7.	Camera system for compound & dissecting microscopes	15,000	Trengganu
	Subtotal	$55,000	

1.4.5 Scuba Diving Equiptments

1.	Underwater communication equipment 1 set	$8,000/-	Serdang
	Subtotal	$8,000/-	

1.4.6 Research and Teaching Aids

1.	Test tank for ship & gear model	$300,000	Trengganu
2.	Microcomputer for statistical analysis	50,000	"
	Subtotal	$350,000	

Summary

The technical assistance requested is summarised and tabulated below:

Type of Aid	1984	1985	1986	1987	1988	Total
1. Training						
Ph.D	2	4	5	3		14
M.Sc	7	4				11
Ad.hoc.	2	5	4	4	1	17
Experts	4	5	4	4	3	20 man years

Equiptments

Laboratory equiptments	791,300	(83 - 85)
Training Vessel equipt	240,000	(83 - 84)
Hatchery equiptment	429,000	(84 - 85)
Photographic equiptment	55,000	(84 - 85)
Scuba diving equiptment	8,000	(84)
Research and Teaching aids	350,000	
Grand total excluding training and expert attachment	$1,873,300	

附　錄　一　(2)

付録(2)

UNIVERSITI PERTANIAN MALAYSIA

LAPORAN KEGIATAN PENYELIDIKAN FAKULTI PERIKANAN DAN SAINS SAMUDRA

REPORT ON RESEARCH ACTIVITIES FACULTY OF FISHERIES AND MARINE SCIENCE

1980 – SEPTEMBER 1983

CONTENTS PAGE

FOREWARD

The establishment of the Faculty of Fisheries and Marine Science, Universiti Pertanian Malaysia in May 1979 signifies a new era of Fisheries education in the country. For the first time, all the major disciplines in the field of Fisheries viz;

1) Fisheries Biology
2) Aquaculture
3) Marine Science
4) Fishing Technology

are brought together under one teaching institution to identify and overcome the problems and enhance the development of fisheries in a systematic and comprehensive manner.

Although young in age, the faculty has embarked on an extensive research programme. Applied and problem solving type research activities are emphasized to reflect the need of the industry and the nation.

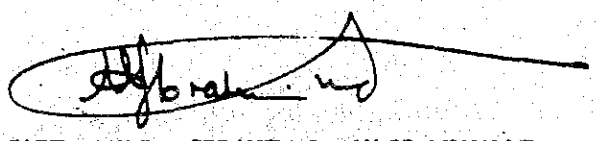
Over 65 publications were produced during the 1980 - Sept 1983 period reflecting the number of research projects that have been completed. A further 26 projects are presently being actively pursued by the faculty staff. Favourable support in term of research grants by international agencies such as IFS, IDRC, FAO and WWF as well as local agencies to the faculty for specific research projects also indicate the high degree of confidence these agencies have on the capabilities of our research workers.

The introduction of graduate programmes by the faculty opens a new dimension in the faculty research activities. To date, 2 Ph.D. and 4 Master of Science students are conducting their post-graduate research at the faculty. Baccalaureate

students are also required to undertake research projects in the final year of study to prepare them for future service and to extend the frontiers of knowledge in the field of Fisheries and Marine Science.

This report codifies the research activities and interests of the faculty during the period under review. It is hoped that this report will be useful to scientists, students, administrators and prospective students to get an overall view of the faculty's current research activities.

My congratulation and sincere thanks goes to Dr. Law Ah Theem for making this inventory and all those who have toiled to make this report meaningful.



CAPT. MOHD. IBRAHIM B. HAJI MOHAMED
Assoc. Professor and Dean, Faculty
Fisheries and Marine Science.

(I) Areas of Specialization of Academic Staff

(A) Department of Fisheries Biology and Aquaculture.

Name	Designation	Specialization
Mohd. Azmi b. Ambak	Lecturer & Head of Department	Fishery Management
Dr. A.K.M. Mohsin	Associate Professor	Taxonomy
Dr. Ang Kok Jee	Associate Professor	Aquaculture
Dr. Mohd. Shariff b. Mohd. Din	Lecturer	Fish Diseases
Dr. Chan Hooi Har	Lecturer	Fish and Invertebrate Physiology
Che Roos b. Saad	Lecturer	Nutrition
Fatimah bte Md. Yusoff	Lecturer	Limnology
Sharr Azni b. Harmin	Lecturer	Inland Aquaculture
Siti Khalijah bte Daud	Lecturer	Fisheries Biology
Aizam b. Zainal Abidin	Lecturer	Aquaculture
Chan Eng Heng	Lecturer	Fisheries Biology
Cheah Sin Hock	Lecturer	Hatchery and Nursery Techniques
Siti Shapor bte Hj. Siraj	Lecturer	Fish Genetics
Mustaffa Kamal b. Abd. Satar	Lecturer	Inland Fisheries
Phillip Arumugam	Lecturer	Aquatic Ecology
Faizah bte Mohd. Shaharom	Tutor	Fish Parasitology
Aziz b. Arshad	Tutor	Invertebrate Biology
Abdullah Zaini b. Alias	Tutor	Invertebrate Culture

(B) Department of Fishing Technology and Marine Science.

Name	Designation	Specialization
Capt. Mohd. Ibrahim b. Hj. Mohamed	Dean, Associate Professor	Fishing Gear Technology/ Marine Policy
Ridzwan b. Abd. Rahman	Lecturer & Head of Department	Marine Biology/Ecology
Dr. M.W.R.N. De Silva	Associate Professor	Marine Ecology
Dr. Law Ah Theem	Associate Professor	Marine Chemistry/ Pollution
Juhari b. Husin	Lecturer	Naval Architecture/ Marine Engineering
Liew Hock Chark	Lecturer	Marine Zooplankton/ Ecology
Abd. Rahim b. Ibrahim	Lecturer	Fishing Port and Vessel Management
Haji Umar b. Salleh	Head of Marine Station, Lecturer	Mariculture
Khalid b. Samo	Lecturer	Fishing Vessel Technology
Mohd. Zaki Mohd. Said	Lecturer	Marine Biology
Lokman b. Shamsuddin	Lecturer	Biological Oceanography
Mohd. Isa b. Mansor	Lecturer	Marine Electronics
Zainal Ashirin b. Shahardin	Lecturer	Fish Gear Technology
Mohd. Maidin b. Hamid	Lecturer	Fishing Techniques
Mohd. Nasir b. Saadon	Tutor	Nautical Science

(II) Research Interests of Academic Staff

(A) Department of Fisheries Biology and Aquaculture.

Dr. A.K.M. Mohsin/Mohd. Azmi b. Ambak
Culture of catfish, *Mystus spp.*

Mohd. Azmi b. Ambak
Management of inland waters.

Dr. Ang Kok Jee
(i) Cage culture of Kalui (*Osphronemus gouramy*).
(ii) Larval rearing and nutrition of *Macrobrachium rosenbergii* juvenile.

Mustaffa Kamal b. Abd. Satar
Inland water management (lakes, reservoirs, rivers etc.).

Fatimah bt. Md. Yusoff
(i) Water quality and nutrient cycling.
(ii) Aquatic productivity (primary, zooplankton and benthos productivities).

Siti Khalijah bt. Daud
(i) Biology and taxonomy of fishes.
(ii) Stomach content of fishes.

Siti Shapor bt. Hj. siraj
Fish Breeding.

Cheah Sin Hock
(i) Larval rearing of *Macrobrachium rosenbergii*.
(ii) Rearing of live food for larval fish.

Sharr Azni b. Harmin
(i) Induced breeding of catfishes.
(ii) Morpho-histological studies of freshwater fishes.

Aizam b. Zainal Abidin
Breeding, Biological and Nutritional Studies of Ikan Patin (Pangasius sutchi).

Dr. Mohd. Shariff b. Mohd. Din
(i) Host-parasite relationship.
(ii) Study of Lernaeosis in Malaysia.

Faizah bt. Mohd. Shaharom
Taxonomy and Biology of monogenetic trematodes on freshwater cultured fish in Malaysia.

Dr. Chan Hooi Har
Fish and invertebrate reproductive physiology in particular, endocrinology.

Chan Eng Heng
Trophic positions of demersal fishes.

Che Roos b. Saad
Aquaculture with emphasis on nutrition.

(B) Department of Fishing Technology and Marine Science.

Capt. Mohd. Ibrahim b. Hj. Mohamed
(i) Effects of trawl cod-end mesh size on catch.
(ii) Malaysian fishing gears.

Ridzwan b. Abd. Rahman
(i) Coral reef conservation and management.
(ii) Coastal water ecology.

Dr. M.W.R.N. De Silva

(i) Ecology, utilization and conservation of coral reefs.

(ii) Effect of oil pollution on marine organisms.

(iii) Ecology and taxonomy of marine algae.

Dr. Law Ah Theem

Marine chemistry and oil pollution.

Mohd. Zaki b. Mohd. Said

Trawl fisheries and biology of the commercially important species.

Liew Hock Chark

(i) Ichthyoplankton of the South China Sea.

(ii) Fish recruitment on artificial type reefs.

Mohd. Isa b. Mansor

Design of echo-sounder simulator for fishing.

Haji Umar b. Saleh

(i) Breeding of marine and brackish water fish.

(ii) Laboratory culturing of zooplankton.

Juhari b. Husin

Floating breakwaters from scrapped automobile tyres.

Lokman b. Hj. Shamsudin

(i) Nutrient studies, both inorganic and organic in an aquatic system.

(ii) Primary studies in relation to inorganic or organic pollution of aquatic system.

Zainal Ashirin/Juhari Husin/Maidin Hamid

(i) Catch efficiency of local longlines.

(ii) Optimum hang in coefficient for gill net.

(iii) Socio-Economic Status, Living condition and Income condition of a typical fishing village.

(III) On-going Research

(A) Department of Fisheries Biology and Aquaculture.

1. Estimation of population size, growth, mortality and distribution of fish in Paya Bungor:
   Mohd. Azmi b. Ambak

2. Effects of neuroendocrine factors on prawn reproduction:
   Dr. Chan Hooi Har

3. Larval rearing and nutrition studies of udang galah (M. rosenbergii):
   Dr. Ang Kok Jee
   and Cheah Sin Hock.

4. Nutrition studies of grass carp (Ctenophyaryngodon idella) on pellet feed:
   Dr. Law Ah Theem

5. Culture of Ikan Baung (Mystus spp.):
   Dr. A.K.M. Mohsin,
   Mohd. Azmi b. Ambak,
   Sharr Azni b. Harmin and
   Mustaffa Kamal b. Abd. Satar.

6. Cage culture of Ikan Kalui (Osphromenus gouramy):
   Dr. Ang Kok Jee,
   Cheah Sin Hock and
   Sharr Azni b. Harmin.

7. Immune response of big head carp (Aristichthys nobilis) to Lernaeosis:
   Dr. Mohd. Shariff b. Mohd. Din

8. Biology of *Dactylogyrus nobilis* from *Aristichthys nobilis* and *Quadricanthus batrachus* from Malaysia:
Faizah bt. Mohd. Shaharom

(B) Department of Fishing Technology and Marine Science.

1. Marine growth on metal coupons placed at different depths in the Tapis oil field, Trengganu:
Dr. M.W.R.N. De Silva
and Ridzwan b. Abd. Rahman.

2. Selectivity studies on Malaysian Trawls:
Capt. Mohd. Ibrahim b. Hj. Mohamad

3. The biology and population dynamics of *Nemipterus tolu*:
Mohd. Zaki b. Mohd. Said

4. Acoustic equipments on Fishing and Research Vessel:
Mohd. Isa b. Mansor

5. Design and construction of fishing vessel:
Juhari b. Husin

6. Primary productivity of waters along East Coast of Peninsula Malaysia:
Lokman b. Shamsudin

7. Status of the coral reefs in Malaysia:
Dr. M.W.R.N. De Silva
and Ridzwan Abd. Rahman.

(IV) Research Funded By Outside Organizations

Researcher(s)	Organization	Title of Research	Amount/Date
Dr. Ang Kok Jee	International Foundation of Science, Sweden.	Cage Culture of Freshwater fish.	14,600/1978
Dr. Ang Kok Jee and Dr. Baharin b. Kassim (late)	FAO	Review on the status of Rice-cum-fish culture in Asia.	8,000/1979 (U.S.)
Dr. Mohd. Shariff b. Mohd. Din	IDRC	Fish Parasite Malaysia.	40,000/1980-1982
Dr. Law Ah Theem	IDRC	Nutrition studies of Ikan Jelawat (Leptobarbus hoevenii) on MC-3 feed of MARDI.	19,250/1981
Dr. M.W.R.N. De Silva	ESSO, Malaysia.	Removal of the 'Crown of Thorns' starfish from the coral reefs at Pulau Kapas, Trengganu.	2,500/1981
Dr. M.W.R.N. De Silva and Ridzwan b. Abd. Rahman	ESSO, Malaysia.	Seasonality in the eggs laid by cuttle fish Sepra pharaonis and monitoring the 'Crown of Thorn' starfish on the coral reefs of Pulau Kapas, Trengganu.	21,400/1982

Researcher(s)	Organization	Title of Research	Amount/Date
Dr. M.W.R.N. De Silva	World Wildlife Fund Malaysia.	Survey of coral reefs of Pulau Paya/Segantang group of islands, Kedah.	7,000/1982
Fatimah Yusoff, S. Che Roos and Sharr Azni Harmin.	MAJUIKAN, Malaysia.	Prefeasibility studies of potential aquacultural sites.	17,986.50/1982
Dr. M.W.R.N. De Silva and Ridzwan Abd. Rahman.	ESSO, Malaysia.	Marine growth study.	23,400/1983
Dr. Law Ah Theem	IDRC	Nutrition study of grass carp (Ctenopharyngodon idella) on the MARDI pelleted feed.	18,240/1983
Tuan Haji Umar, Isa Mansor, Juhari Husin, Liew Hock Chark, Zainal Ashirin, Chan Eng Heng and Lokman Shamsudin.	State of Trengganu, Ministry of Agriculture and Lembaga Kemajuan Ikan Malaysia.	Break water, Trengganu.	460,000/1983

Researcher(s)	Organization	Title of Research	Amount/Date
Ridzwan Abd. Rahman, Dr. M. W.R.N. De Silva, Fatimah Yusoff, Siti Khalijah Daud, Mustafa Kamal A. Satar, Abdullah Zaini Alias, Siti Zauyah Darus (Soil Sci.), Lai Food See (Forestry), Ong Siew Ling (Forestry), Dr. Charles D. Getter (U.S.A.), Dr. Ian R. Lam.	PETRONAS	An Environmental Sensitivity Index (ESI) Mapping of Dungun-Chukai, Coastline.	100,000/1983
Dr. Mohd. Shariff Mohd. Din and Faizah Shaharom.	IDRC	Fish Parasite Malaysia.	300,000/1983-1985

(V) Research Areas of Post-Graduate Candidates

Ph.D. Candidate	Thesis Title
Mohd. Azmi b. Ambak	Estimation of size, growth, mortality and distribution of fish in Paya Bungor. (Supervisor: Dr. A.K.M. Mohsin)
Mohd. Zaki b. Mohd. Said	Biology and population dynamics of *Nemipterus* spp. off the coast of Trengganu. (Supervisor: Dr. A.K.M. Mohsin)

M.Sc. Candidate	Thesis Title
Aizam b. Zainal Abidin	The biology of Ikan Sebarau (*Hampala macrolepidota*) with emphasis on food and reproduction. (Supervisor: Dr. Ang Kok Jee)
Poh Yong Thong	Studies on some aspects of the nutrition of juvenile *Macrobrachium rosenbergii*. (Supervisor: Dr. Ang Kok Jee) (Co-Supervisor: Dr. Law Ah Theem)

Kabir Ahmad	Larval rearing of Macrobrachium rosenbergii using microcapsule feed. (Supervisor: Dr. Ang Kok Jee) (Co-Supervisor: Cheah Sin Hock)
Amargit Singh	A study of the heavy metals distribution in Klang estuary. (Supervisor: Dr. Law Ah Theem)

(VI) Final Year B.S. (Fisheries) Projects, 1982/83

Name	Topic	Supervisor(s)
Safiah bt. Sayuthi	A comparative histological studies on the skin of commonly cultured fishes.	Dr. Mohd. Shariff b. Mohd. Din
Abdul Razak Latun	Behaviour and distribution study of the two Mollusks, (Nerita spp. and Nassarius spp.) on a sheltered rocky shore at Pulau Kapas.	Ridzwan b. Abd. Rahman
Mohd. Fauzi Abdullah	Accumulation of mercury in lamban jawa (Pontius goniono tus).	Dr. Law Ah Theem
Hashim b. Ahmad	Laboratory studies on the feeding of Tilapia nilotica fed with chicken feed and formulated diets.	Che Roos b. Saad

Name	Topic	Supervisor(s)
Lim Song Hock	Effects of progesterone on ovarian maturation in the penaeid prawn, Penaeus merguiensis (De Man).	Dr. Chan Hooi Har
Hamdan Jaafar	Primary productivity in Tropical Fish Ponds in Serdang, Selangor.	Fatimah bt. Md. Yusoff
Ong Siew Lui	Effects of malathion on Sarotherodon mossambicus (Peters) and Trichogaster pectoralis.	Dr. A.K.M. Mohsin & Mohd. Azmi b. Ambak
Norazmi Hj. Selamat	Growth response of Tiger Barbs (Puntius tetrazona partipentazona) fed with commercially available tropical fish hobbyist fish food.	Cheah Sin Hock
Mohd. Nasir Saadon	Some experiments on the effect of oil pollution on the marine alga Enteromorpha flexuosa (Wulf. ex Roth).	Dr. M.W.R.N. De Silva
Rohani Mohd. Rose	The effects of salinity on the growth and some morphological and anatomical characters of Enteromorpha flexuosa (L) Grev.	Dr. M.W.R.N. De Silva
Rohani Ibrahim	Accumulation of lead in lampam jawa (Pontius gonionotus).	Dr. Law Ah Theem

Name	Topic	Supervisor(s)
Mohd. Khairudin Abu Bakar	Primary productivity study; Diurnal variation in photoshythetic values and inorganic nutrient contents of Sungai Manir and Sungai Ibai, Trengganu within a given tidal cycle.	Lokman b. Shamsudin
Mohamat Hatta Hj. Mahmud	Physical properties of local netting twine (dry state).	Capt. Mohd. Ibrahim b. Hj. Mohamad
Wan Mohd. Adnan Wan Ibrahim	Physical properties of some local netting twine (wet state).	Capt. Mohd. Ibrahim b. Hj. Mohamad
Mohd. Subri Saadon	comparative studies of the distribution of invertebrates found in exposed and protected rocky shores of Pulau Kapas, Trengganu.	Ridzwan b. Abd. Rahman
Mohd. Mohd. Jaid	Effect of pH on survival and growth of grass carp juveniles.	Mohd. Azmi b. Ambak
Musa Ibrahim	Feeding experiment of a local fish - Preliminary studies on the optimum protein requirements of Puntius gonionotus fry.	Che Roos b. Saad
Rosidi Ali	Multiple recapture methods in fish population studies.	Mohd. Azmi b. Ambak
Mohd. Fadzil Suhaimi Ramli	Operation an management of landing port in Kuala Trengganu; A Case Study.	Juhari b. Husin

Name	Topic	Supervisor(s)
Mohd. Kushairi Mohd. Rasidi	Domestic sewage pollution of Lake Taman Jaya, Petaling Jaya.	Fatimah bt. Md. Yusoff/ Dr. Law Ah Theem
Mohammad Zaidi Zakaria	Communication and agonistic behaviour of mangrove crab Scylla serrata (Forskal).	Hj. Umar b. Saleh
Munir Hj. Mohd. Nawi	A survey on molluscs around Sungai Ibai estuary and the economic importance of the species found.	Hj. Umar b. Saleh
Rayner Stuel Galid	Acute toxicity of the herbicide, gramoxone PP 910 to the big head carp, Aristichthys nobilis (Richardson) and the grass carp, Ctenopharyngodon idella (Valenciennes).	Dr. A.K.M. Mohsin & Mohd. Azmi b. Ambak
Tan Geik Hong	Growth response of Osphronemus gouramy (Lacepede) juveniles in cages fed with pellets at three levels of crude protein.	Cheah Sin Hock
Azman Yusof	A comparative study of the shocking ability of electroshockers on lampam jawa, Puntius gonionotus (Bleeker) juveniles.	Mohd. Isa b. Mansor

Name	Topic	Supervisor(s)
Aziz Arshad	Studies on Argulosis in Malaysia.	Dr. Mohd. Shariff b. Mohd. Din
Devakie a/p Madhava Nair	Observations on the food and feeding habits of Euthynnus affinis (Cantor) 1850 collected off the Trengganu Coast.	Siti Khalijah bt. Daud

(VII) Publications (1980 - September 1983)

Aizam Z.A., Che Roos, S. & Sharr, H.A. (1983). The growth of ikan patin fingerlings, Pangasius sutchi fed with varying protein levels. Pertanika 6(2): 49-55.

Ambak, M.A. & A.K.M. Mohsin, 1980. Population study, length-weight relationship, size and movement of Acrossocheilus deauratus (C. & V.) in two Malaysian streams. Pertanika 3(2): 142-147.

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Ambak, Mohd. Azmi and Sharr Azni Harmin, 1982. Aspects of Biology, Conservation and Management of Fishes in Trengganu, Peninsular Malaysia. A paper presented at Symposium on Mangrove Forest Ecosystem Productivity. April 20-22, 1982. Bogor, Indonesia.

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(VIII) Research Committee

1980

Dr. Baharin Kassim (late)	-	Chairman
Dr. Law Ah Theem	-	Secretary
Dr. Ang Kok Jee		
Dr. Mohd. Shariff Mohd. Din		
Puan Chan Eng Heng		
En. Ahmad Zohri Hj. Ahmad Zohri		
En. Mohd. Zaki Mohd. Said		
Dr. A.K.M. Mohsin		

1981 and 1982

Dr. Ang Kok Jee	-	Chairman
En. Mohd. Azmi Ambak	-	Secretary
Dr. M.W.R.N. De Silva		
Dr. Mohd. Shariff Mohd. Din		
En. Mohd. Zaki Mohd. Said		
Capt. Mohd. Ibrahim Hj. Mohamed		
Dr. A.K.M. Mohsin		
Dr. Law Ah Theem		

1983

Capt. Mohd. Ibrahim	-	Chairman
En. Mohd. Azmi Ambak	-	Secretary
Dr. Law Ah Theem		
Dr. A.K.M. Mohsin		
Dr. Mohd. Shariff Mohd. Din		
En. Ridzwan Abd. Rahman		
Dr. M.W.R.N. De Silva		
Tuan Hj. Umar Saleh		

附　録　－　(3)

CURRICULUM

FACULTY OF FISHERIES AND MARINE SCIENCE

Introduction

The faculty of Fisheries and Marine Science had its origin in 1974 when the Division of Fisheries and Marine Science was established under the Faculty of Veterinary Medicine and Animal Science. The Diploma in Fisheries programme was subsequently offered in the 1974/75 academic year. On 1st May, 1979 the Division was officially raised to the status of a full faculty thus making the Faculty of Fisheries and Marine Science the eighth faculty established at Universiti Pertanian Malaysia. A degree programme, Bachelor of Science (Fisheries) was offered on the establishment of the new faculty.

Objectives

The faculty plays a direct and indirect role in national development by stimulating and supporting the development of the fisheries industry through its activities which include the following:

a) To train professional and sub-professional manpower requirement to the fisheries sector and other agencies involved in the utilization of the aquatic resources.

b) To conduct basic and applied research to solve current problems in the fisihing industry and to develop new technology appropriate to local situation.

c) To provide advisory and consultancy services to facilitate rapid transfer of new technology to the industry.

d) To stimulate and lead public discussion for resolving issues related to the development of the industry.

To achieve its objectives the Faculty will be constantly in contact with the fishing industry through its vocational programmes during and between semesters. It will have constant dialogues with the Government machinery through the Fisheries Division of the Ministry of Agriculture, MAJUIKAN, MARDI, the private sector and other institutions of higher learning both inside and outside the country. It will also acquaint itself with the problems of the fishermen and fish farmers through its pragmatic extension programmes.

Organizational Structure

Presently there are two departments in the faculty viz.

Department of Fisheries Biology and Aquaculture
Department of Fishing Technology and Marine Science.

Each department is headed by a head of Department.

The two departments set-up is an interim measure to manage the daily activities of the faculty and plan for its future development.

On attainment of full physical and manpower development the faculty will split into four departments, each dealing with a specific discipline in the field of Fisheries and Marine Science. The four departments are:

Department of Fisheries Biology
Department of Aquaculture
Department of Fishing Science and Technology
Department of Marine Science

A Marine Science Station was established at Kuala Trengganu in 1979 to provide physical facilities for practical training and research in the areas of Fishing Science and Technology and Marine Science aspects of the academic programme. The Head of Station has been recognised to possess the same status as the Head of Department. Another field station is in the process of being established in Port Dickson.

Course Curriculum

The focus of the curriculum for the degree of Bachelor of Science (Fisheries) and the Diploma in Fisheries are evolved around the relationships of Man and the Aquatic Organisms. The curriculum gives the student an understanding of the theoretical and applied knowledge of the Aquatic Organisms and their interrelationship with the environment and how this understanding will serve Man and in its turn how Man will exploit and perpetuate them for his benefit.

Degree Curriculum

The student enrolled for the degree programme would acquire sufficient knowledge to fit into a general, managerial and technical position. He is trained to enable him to:

a) raise the economic and social status of the fishermen and fish farmers by increasing their output and income.

b) develop and exploit to the maximum the fisheries resources in accordance with sound fisheries management practices.

c) carry out investigation or research into problems affecting the resources and techniques.

d) become instructors in fisheries training and development programmes.

Diploma Curriculum

The Diploma Programme is aimed at producing technically trained sub-professionals who are capable of directly helping the fisherman or fish farmer with his day to day problems. The curriculum is heavily biased towards the applied aspects of inland and marine fisheries.

DIPLOMA IN FISHERIES

FIRST YEAR

Semester I

Code	Course	Credit
BB	Language	2
BIO 101	Principles of Biology I	3
FIZ 101	Introductory Physics I	3
KIM 110	Physical Chemistry	3
MAT 101	Mathematics I	3
PSS 111	Swimming and water Safety	1
SK 201	Introduction to Sociology	1
SK 202	Introduction to Psychology	1
	Field Work	1
	Total	18

Semester II

Code	Course	Credit
BIO 102	Principles of Biology II	3
BB	Language	2
EKO 111	Basic Economics	2
AKN 210	Introduction to Accounting	2
FIZ 102	Introductory Physics II	2
KIM 120	Organic Chemistry	3
MAT 102	Mathematics II	3
PSS 121	Introduction of Malaysian Fisheries	1
SK 204	Rural Sociology	1
	Total	20

SECOND YEAR

Semester I

Code	Course	Credit
BB	Language	1
PP 203	Development, Execution and Evaluation of Extension Programme	2
PSS 131	Biology of Fishes	4
PSS 132	Biology of Aquatic Invertebrates	3
PSS 133	Aquatic Ecology	3
PSS 134	Applied Aquatic Chemistry	3
PSS 135	Fisheries Law, Management and Conservation	2
	Total	18

Semester II

Code	Course	Credit
BB	Language	1
EPT 133	Introduction to Cooperative Management and Administration	3
MKN 100	Fish Processing and Preservation	3
PSS 141	Aquaculture I	3
PSS 142	Fisheries Microbiology	3
PSS 143	Fishing Gear	2
PSS 144	Navigation and Seamanship I	4
	Total	19

THIRD YEAR

Semester I

Code	Course	Credit
PSS 151	Fishing Methods I	2
PSS 152	Fishing Methods II	2
PSS 153	Navigation and Seamanship II	3
PSS 154	Applied Limnology and Oceanography	3
PSS 155	Food and Nutrition of Fishes	3
PSS 156	Project Elective and Presentation I	4
	Total	17

Semester II

Code	Course	Credit
EPT 132	Fisheries Marketing	2
PSS 161	Aquaculture II	3
PSS 162	Seminar	1
PSS 163	Fish Diseases	3
PSS 164	Hatchery and Nursery Management	3
PSS 165	Project Elective and Presentation II	4
	Total	16

BACHELOR OF SCIENCE (FISHERIES)

FIRST YEAR

Semester I

Code	Course	Credit
AGRO 200	Introduction to Agriculture	1
BB	Language	2
BIO 301	Principles of Biology III	3
FIZ 206	Applied Physics	3
KIM 220	Organic Chemistry	3
MAT 301	Concepts in Algebra and Calculus	2
SK 201	Introduction to Sociology	1
SK 202	Introduction to Psychology	1
	Total	16

Semester II

Code	Course	Credit
KPS 202	Technical Drawing	2
BB	Language	2
BIO 302	Principles of Biology IV	3
EKO 311A	Principles of Economics	2
KIM 210	Physical and Inorganic Chemistry	3
MAT 304	Statistics for Applied Sciences	2
PSS 111	Swimming and Water Safety	1
SK 204	Rural Sociology	1
SK 205	Social Psychology	1
	Total	17

SECOND YEAR

Semester I

Code	Course	Credit
BKM 300	Basic Biochemistry	3
ESA 454	Fisheries Economics	3
PSS 331	Anatomy of Fishes	2
PSS 332	Vertebrate Systematics	3
PSS 333	Aquatic Ecology	3
PSS 334	Biology and Systematics of Aquatic Invertebrates	3
PSS 335	Psychology	2
	Total	19

Semester II

Code	Course	Credit
KPS 217	Engineering Technology for Fisheries	3
ESA 357	Fisheries Institution	2
PSS 341	Physiology and Behaviour of Fishes	3
PSS 342	Principles of Aquaculture	2
PSS 343	Introductory Limnology	3
PSS 344	Fish Nutrition	3
PSS 345	Aquatic Microbiology	3
	Total	19

THIRD YEAR

Semester I

Code	Course	Credit
PSN 310A	Business Organisation and Management	2
MKN 332	Fish Processing and Preservation	3
PSS 351	Seminar	1
PSS 352	Fish Diseases I	3
PSS 353	Nautical Sciences	4
PSS 354	Nursery and Hatchery Technical	3
PSS 355	Breeding and Genetics of Fish	2
	Total	18

Semester II

Code	Course	Credit
PSS 361	Introductory Oceanography	3
PSS 362	Principles of Fishing Gear	2
PSS 363	Fish Population Dynamics	2
PSS 364	Fisheries Meteorology	2
PSS 365	Coastal Aquaculture I	3
PSS 461	Fish Taxonomy	2*
PSS 462	Nautical Science II	2*
PSS 463	Fish Resource Management	2*
PSS 464	Biology of Marine Invertebrates	2*
	Total	16

* Elective Courses

* Students are required to take at lease two electives per semester

FOURTH YEAR

Semester I

Code	Course	Credit
PP 203	Development, Execution and Evaluation of Extension Education	2
PSS 371	Fishing Methods	2
PSS 372	Research Methods and Statistics	2
PSS 373	Fishing Operation	2
PSS 374	Fishing Gear Technology	2
PSS 375	Fishing Port and Vessel Management	2
PSS 376	Fishing Instrument and Electronics	2
PSS 471	Biological Oceanography	2*
PSS 472	Physical Oceanography	2*
PSS 473	Fish Physiology	2*
PSS 474	Deck Machinery	2*
PSS 475	Coastal Aquaculture	2*
	Total	18

Semester II

Code	Course	Credit
PSS 381	Freshwater Aquaculture I	3
PSS 382	Project and Seminar	5
PSS 383	Resource Evaluation Management	3
PSS 481	Freshwater Aquaculture II	2*
PSS 482	Limnology	2*
PSS 483	Chemical Oceanography and Marine Pollution	2*
PSS 484	Fish Diseases II	2*
	Total	15

SYNOPSES OF COURSES OFFERED BY THE FACULTY OF FISHERIES AND MARINE SCIENCE

PPS 111 Swimming and Water Safety **1 credit**

Theory on Red Cross Simple First Aid, Water Safety and Boat Saaety. Practical aspects on the introduction into the various swimming techniques including the front crawl, back stroke and breast stroke; recovering object from 6–8 feet of water; demonstrating basic rescue techniques and use of clothing as floatation aids.

PSS 121 Introduction to Malaysian Fisheries **1 credit**

History and development of the fisheries industry in Malaysia. Role of fisheries in the national economy and in human nutrition. General survey of Malaysian fisheries resources and distribution according to habitats, species, gear-groups, etc. Status and potentials of aquaculture. Fisheries administration and organisations (government, semi-government and private sectors) in Malaysia, to include their structure, roles and functions.

PSS 131 Biology of Fishes **4 credits**

Basic anatomy and physiology of fish, to include discussion on diversity in structure, function and habits with emphasis on feeding, growth, reproduction and life-history. Classification and identification of local commercial species.

PSS 132 Biology of Aquatic Invertebrates **3 credits**

Classification and identification of local commercially important species. Structure, function, habits and life-history of various common invertebrates, especially the commercially important species e.g. prawns, crabs, mussels, cockles, oysters, cuttlefish, squids, corals, etc.

Use of keys for classifying organisms. Field identification, preservation and transportation of organisms. Studies on the morphology and anatomy of commercially-important invertebrates.

PSS 133 Aquatic Ecology **3 credits**

Introduction to ecology. Nature of ecosystem, energy flow and biogeochemical cycles. Ecological factors e.g. temperature, light. Organisation and dynamics of some aquatic ecosystems. Some ecological considerations eg. migration, biological clock, succession, stratification and zonation of biota. Applied ecology-mainly pollution aspects and management of local aquatic systems.

Laboratory estimation of primary production; analysis and interpretation of data on production of some ecosystems. Classification and identification of algae with emphasis on ecological significance; as a resource and problem to man. A general survey of some aquatic ecosystems, eg. intertidal, coral reefs, coastal, oceanic and freshwater communities.

PSS 134 Applied Aquatic Chemistry **3 credits**

Basic concepts in analytical chemistry with emphasis on the aquatic system. The chemistry of freshwater and seawater. The fundamental theory and application of titration, solvent extraction, photospectroscopy, atomic absorption spectroscopy, etc. for chemical analysis of water and soil. Laboratory practicals; determination of salinity, alkalinity, turbidity, hardness, oxygen content, pH, phosphate, silicate, nitrate, ammonia, etc. in the water as well as the determination of crude protein, lipids and other chemicals in the fish and fish feed. The care and proper use of pH meter, spectrophotometer, O_2 analyzer, HACH kit, analytical balance, etc.

PSS 135 Fisheries Law, Management and Conservation **2 credits**

Principles of fish management and conservation introduction, definition, history and early attempts of managements. Objectives and methods of management. Marking as a tool for research and management. Carrying capacity, productivity and growth, plumpness of fish, age and growth, maximum sustainable yield. Population dynamics. Sea management and problems related to Malaysian waters.

International law of the sea – convention of the high seas, fishing and conservation of living resources of the sea, continental shelf and the territorial and contiguous seas. Application of international law of fisheries. Malaysian Fisheries Act and Regulations.

PSS 141 Aquaculture I **3 credits**

History and development of aquaculture. Principles of inland and coastal aquaculture. Ranges of aquaculture practices. Biological principles underlying the practices of aquaculture. Desirable characteristics in a cultured organism. The physico-chemical qualities of water and soil for aquaculture. The roles of calcium, magnesium, nitrogen, phosphorous, potassium etc. in the productivity of fish ponds. Selection of pond site. Topography, soil type, water quality and quantity.

Design and construction of ponds. Freshwater and brackish water ponds. Preparation of ponds for stocking. Stocking rates. Monoculture and polyculture. Factors affecting maximum standing crop. Fertilization of ponds. Fertilizers – organic and inorganic. Control of ponds biota. Types of ponds biota and their control – biological, mechanical and chemical. Supplementary feeding and natural food. Importance of artificial feed. Principal food used in fish culture-food of plant and animal origins and dry concentrated food. Maintenance and repair of ponds. Visit to aquaculture centres and commercial fish ponds.

PSS 142 Fisheries Microbiology 3 credits

Fundamental microbiology with emphasis on the aquatic system. The structure of bacteria, actinomycetes, fungi, algae, protozoa and viruses. The important role of microorganisms in the aquatic environment, method of sterilization, cultivation, disinfection, chemotherapy, etc. Application of microbiological techniques in fish preservation and fish pathology. The study of microbial infections on local fishes and their isolation. Laboratory practicals include staining techniques, morphology study, medium preparation and sterilization, enumeration, cultivation and identification of microorganisms in the aquatic environment as well as in fishery products.

PSS 143 Fishing Gear 2 credits

Classification of fishing gears. Classification of fishing gear materials – physical and chemical properties. Twine and rope construction and numbering system. Calculation of taper rates, hanging ratio, theoretical depth, slack coefficient of webbing. Making and reading fishing gear specifications and plans. Net loft work. Care and maintenance of fishing gear – making a webbing, selvedges, baitings, creasing; flymeshes, mending quarters.

PSS 144 Navigation and Seamanship I 4 credits

Introduction: parts of a ship, shipboard terminology, anchor work. Strength of ropes, wire and chains, blocks and tackles. Deck appliances. Rules of the road, morse code and international code of signal flags. Life saving appliances. Duties of trawler officer on board. Seamanship laboratory includes handling ropes and wires, knots, bends and splices. Bosun's chair and staging. Basic principles of navigation. Coastal navigation, tides, international buoyage system and chart work. Sextant.

PSS 151 Fishing Methods I 2 credits

Principles and operation of traps, fish and crab pots, gill-nets, long lines, hand lines, beach seines. Vessels and deck layouts and ancillary gears. Choice of fishing grounds. Design and construction of these gears. Modern trends in inshore vessels and fishing gears. Net loft work, mending large tears, replacement of panels, scorning, assembly and roping of gill-nets and bottom long lines.

PSS 152 Fishing Methods II 2 credits

Principles and operation of trawling covering side trawling, stern trawling, pair trawling, shrimp trawling and mid-water trawling. Purse seining, seining. Modern trend in fishing vessels – multipurpose vessels and varied net handling arrangements. Fish handling – preserving the quality of the catch from the fishing grounds to the fishing port. Fish detection by echo-sounders, and sonar. Net loft work including roping and assembly of bottom trawls, midwater trawls and making scale model nets.

PSS 153 Navigation and Seamanship II 3 credits

Shiphandling – single screw, twin screw, coming along side, ship emergency procedure. Logbooks, ships displacement terms. Basic engineering knowledge, ship stability, R.T. Morse code and international code. Laboratory work to include wire splicing, maintenance and use of blocks and tackles. Ships chronometer, time. Principles of navigation, compass error by amplitude of the sun, true altitude, latitude by Meridian altitude. Longitude by intercept. Position fix, laboratory work to include naviation aids. Auto direction finders, echo-sounders and radar – operation and limitations.

PSS 154 Applied Limnology and Oceanography 3 credits

General introduction to ocean basins and the origin of oceans including sea-floor spreading and continental drift processes. Formation of marine bottom types (marine sediments, limestone, coral, beachrock, sandbars, etc.) Subsea mineral and fossil fuel resources. Physiochemical properties of seawater and their effects on some marine organisms. Tides. Waves, currents. Upwelling. Fisheries forcasting.

General outline of freshwater lentic and lotic systems. Physical properties of water. Local edaphic influence on freshwater bodies (peat soil, acid-sulphate soils ect.). Local man made systems (padi-fields, tin mining ponds, reservoirs etc.).

Limnological significance and instrumentation of some physico-chemical factors (thermal, optical, specific conductance, water movements, nutrients, etc.). Biological communities and productivity of freshwater systems and its applied aspects.

Physico-chemical water analysis techniques/procedures; qualitative/quantitative estimation of biotic communities; application of techniques/procedure and qualitative/quantitative estimation to some local aquatic environments.

PSS 155 Food and Nutrition of Fishes 3 credits

Natural foods and feeding, with emphasis on plankton, food chains and trophic relationships. Fate of ingested food – digestion, absorption and utilization. Food conversion efficiency. Basic nutritional requirements in fish. Nutritional disorders. Feed formulation and composition. Processing of pellets, meals, pastes and cakes. Biological and proximate analysis of feeds. Practicals on collection and identification of plankton; analysis of feeding habits of some common fishes, chemical analysis of feeds.

PSS 156 Project Elective and Presentation I 4 credits

Supervised individual projects within the University or supervised on-the-job training in governmental or quasi-government bodies, fisheries industry or fisheries organization. Project proposal, progress reports and final presentation both in written and seminar forms are required.

PSS 161 Aquaculture II 3 credits

Types and methods of freshwater and brackish water culture. Extensive and intensive culture, padi-field culture, cage culture and culture of specific species – carps, gouramis, snake-head, catfish, udang galah, groupers, milkfish, mullets, cockles, oysters, shrimps, frogs, crocodiles, seaweeds. Sewage-fed fisheries. Culture of some important invertebrates for fish food–infusoria, bloodworms, water-fleas. Harvesting, handling and transportation of cultured organisms. Seed production and supply. Techniques in fish breeding–natural and induced spawning.

PSS 162 Seminar 1 credit

Seminars on various fisheries topics by invited guests from the universities, industries, government and research institutions. Students' seminars and/or debates on assigned topics in fisheries.

PSS 163 Fish Diseases 3 credits

Fish diseases caused by organisms and nutritional deficiencies and their differences. Identification of the common fish diseases and collection of samples to be sent for post mortem. Life-cycle of common fish parasites. Prevention and known treatment of certain common fish diseases.

PSS 164 Hatchery and Nursery Techniques 3 credits

Layout of a typical fish hatchery. Setting up of a simple filtration system. Water quality and supply to hatchery and nursery ponds. Types of incubators for hatching eggs. Food–artificial and live food. Stocking and management of frys. Handling and transportation of fish fry. Prevention and treatment of diseases common to fish frys.

PSS 165 Project Elective and Presentation II 4 credits

Supervised individual projects within the University or supervised on-the-job training in governmental, or quasi-government bodies, fisheries industry or fisheries organizations. Project proposal progress reports and final presentation both in written and seminar forms are required.

PSS 212 Fish Culture 2 credits

History and development of aquaculture. The physico-chemical qualities of water and soil for aquaculture. Selection of pond site. Design and construction of ponds. Preparation and stocking of ponds. Application of fertilizers in fish ponds. Feeding and supplementary feed. Stocking rates. Maintenance and repair of ponds. Types of fish culture practices. Harvesting and post harvest handling. Seed production and supply. Fish breeding. Practicals include analysis of soil and water for fish pond. Construction of pond. Analysis of feeds used in fish culture. Visit to fish farms.

PSS 221 Fisheries Science 2 credits

Introduction to Malaysian fisheries – present status and developments. General survey of Malaysian Fishery Resources. Classification of capture fisheries by species. Classification of capture fisheries by habitat-pelagic and demersal fisheries. Analysis of condition of the existing fisheries and its potential. Introduction and classification of fishing gears. Principles and operation of fishing gears. Factors for selection and efficiency of each fishing gear. Cost of operation for each fishing gear unit. Future trends in fishing operations. Fish processing. Fish

preservation. Status and potential of aquaculture in Malaysia. Prerequisites for fish culture. Choice of species, present farmed species, deviation eg. induced spawning. Pond construction, principles of pond management and care. Culture practices of a few presently farmed species. Generalised energy flow in eco-systems. Biogochemical cycles. Aquatic pollution and ecological principles. First step in conservation and early attempts in management. Definition, objectives and manaagement techniques. Methods of management regulation. Commercial and recreational fisheries management. Sea management and problems in Malaysian waters.

PSS 222 Limnology and Coastal Oceanography 3 credits

General outline of freshwater lentic and lotic systems. Hydrological cycle and water balance. Physico-chemical regime. Local natural systems (peat swamps, etc.) and man-made systems (padi-fields, tin-mining pools, fish ponds, reservoirs, irrigation canals, etc.). Interactions of freshwater organisms with their environment. Productivity of some freshwater bodies. General management of inland water resources (include pollution, conservation, fisheries, multipurpose, resource management).

Introduction to oceanography. Tides and waves. Currents. Atmosphere and ocean. Physico-chemical properties of seawater. Interactions of marine organisms with their environment. Cycle of production in the sea. Estuaries – a special case. Pollution (coastal zone, general effects of pullutants, specific pollutants, microbial aspects, effects on coastal fisheries). Biological basis on marine conservation.

Physico-chemical water analysis, techniques/procedures. Equipment demonstrations. Field trips. Case studies.

PSS 331 Anatomy of Fishes 2 credits

Essential features of the lower types; External anatomy and adaptive radiation in fishes; skin and exoskeleton; Comparative anatomy of endoskeleton in fishes; comparative anatomy of digestive, respiratory, circulatory, urinogenital, nervous system and sense organs in fishes.

PSS 332 Vertebrate Systematics 3 credits

History and development of modern taxonomy; rules of systematics, taxonomy and classification; principles and methods of classification; biological properties of species, morphological characters of species; kinds and species. Isolating mechanisms and hybridization in fishes; geographic variation and speciation in fishes, ecology of speciation; Taxonomic collections, preservations and process of identification, taxonomic decisions on the species level and procedure of classifying with emphasis on the commercially important food fishs of Malaysia; Zoological nomenclature.

PSS 333 Aquatic Ecology 3 credits

Ecosystem Concept

Basic ecological principles and concepts pertaining to ecosystems, energy-flow, laws of thermodynamics, biological control, homeostasis, food chains /webs; pyramids, trophic structure, etc. Quantitative energy-flow patterns in a few selected examples. Primary production. Consumer production.

Biogeochemical Cycles

Hydrological cycle. Inter-relationships of land-sea-air. Gaseous and sedimentary cycles and their ecological significance. Marine and freshwater cycles.

Limiting Factors

Liebig's/Shelford's/Combined "Laws". Ecological indicators.

Community and Population Aspects

Ecological Dominance. Species diversity. Patterns in communities. Ecotone/edge effect. Population properties – density, natality, mortality, intrinsic growth rate, age distribution, growth forms, carrying capacity, etc. Types of interactions.

Habitat Studies

Classification of aquatic ecosystems. Terminology. Niche/habitat. Ecological constraints and community structure in freshwater, estuarine marine ecosystems with emphasis on Malaysian habitats – include field surveys.

Ecological Factors

A few selected parameters – light, temperature, moisture.

Ecological Phenomena

A few selected topics – migration, biological clocks/rhythms, mimicry, adaptation, succession, climax, etc.

Applied Aspects

Conservation – defination, history, reasons for conservation, and conservation practices. Aquatic pollution – regional and global impact, nature and sources of water-borne pollutants, effects of pollution on fishes aquatic resources and Man, water quality and management, abatement and control, susceptibility of local environments. Man-made close self-contained ecosystems.

PSS 334 Biology and Systematics of Aquatic Invertebrates 3 credits

The morphology, anatomy, physiology, nutrition, life-history and classification of aquatic invertebrates with special emphasis on local fauna. Detailed studies of economically important groups such as corals, crustaceans and mollusca.

PSS 341 Physiology and Ethology of Fishes 3 credits

Analysis of the action, functions and adaptations of organs and systems – locomotion; integumentary functions; feeding, digestion and absorption; respiration; blood and circulation; osmotic regulation and excretion; nervous and endocrine control; reproduction. Homeostasis and growth. Ethological analysis of fish behaviour – breeding behaviour and modes of reproduction; migrations and feeding relationships. Interactions between fish and their biotic and abiotic environments.

PSS 342 Principles of Aquaculture 2 credits

History and development of aquaculture with emphasis on the Southeast Asian region. Principles of inland and coastal aquaculture. Range of aquaculture practices. Biological and economic principles underlying the practices of aquaculture. The physico-chemical qualities of water and soil for aquaculture. The role of dissolved substances in the productivity of ponds. Methods of seed production. Natural and induced spawning in cultivated fishes.

PSS 343 Introductory Limnology 3 credits

Origin of lakes and historical background. Hydrological cycle and water balance of natural and man-made freshwater bodies. Physical properties of freshwater systems-thermal, optical, density, surface tension, water movements, turbidity. Nature and composition of dissolved substances – oxygen, nitrogen, phosphorus, carbon, sulphur, silica, iron, calcium, manganese. Biology and productivity of freshwater biota – phytoplankton, zooplankton, macrophytes and benthos. Applied aspects – pollution, conservation and management of inland waters. Field surveys of different fresh-water systems-ponds, reservoir, stream, mining pools, padi-fields. Research paper on current topics in Limnology.

PSS 344 Fish Nutrition 3 credits

Investigation of the varieties and abundance of natural foods. Requirements for energy and non-energy foods (proteins, fats, carbohydrates, vitamins and minerals) and their roles and functions. Energy requirements and, the calorific values of fish feeds. Natural and artificial ingredients commonly used in practical diets, and their food values. Formulation of feeds. Fish feed processing and storage. Feed evaluation – proximate analysis, digestibility and analysis of growth response and conversion efficiencies. Nutritional fish diseases and pathology.

PSS 345 Aquatic Microbiology 3 credits

Basic principles of microbiology with emphasis on aquatic environment. Ecology, distribution, physiology and metabolic activities of microorganisms – bacteria, fungi, algae and protozoan in the aquatic environments. Geomicrobiological and mineralization activities of the aquatic microorganisms. Marine microbiology. Microbiology of fish and crustacean, other fishery by-products.

PSS 351 Seminar 1 credit

Seminar on fisheries institutions and related topics will be given by invited speakers.

PSS 352 Fish Diseases I 3 credits

Basic concept of histology, pathology, microbiology and parasitology pertaining to fish diseases. A systemic study of the common freshwater and marine fish diseases – etiology, epidomiology, clinical signs, pathogenesis, laboratory diagnosis, treatment and control.

PSS 353 Nautical Science I 4 credits

Shipboard terminology and orientation. Ropes, wires, block, tackles and derrick system. International regulation for preventing collision at sea. Marine communications. Safety at sea and life saving appliances. Division of work aboard ship.

Fundamental of navigation, charts, chartwork. Buoyage system and pilotage. Tidal theories and calculations. Radio navigation systems.

PSS 354 Nursery and Hatchery Technique **3 credits**

Layout of a typical fish hatchery. Kinds of filter – biological, mechanical and chemical. Water quality and supply to hatchery and nursery ponds. Methods of hatching eggs. Types of incubator. Food – natural and artificial. Preparation and management of breeding and nursery ponds. Culture of invertebrates for fish food. Handling and transportation of fish seeds and breeders.

PSS 355 Breeding and Genetics of Fish **2 credits**

Introduction to the principles of quantitative and population genetics. Estimation of heritability and repeatability. Correlated characters. General principles of selection. Systems of breeding. Genetic variability and hybridisation in fish population.

PSS 361 Introductory Oceanography **3 credits**

Characteristics of ocean; physical properties of ocean – winds, tides and currents; chemical composition and properties of seawater; plankton and benthic communities; marine pollution.

PSS 362 Principles of Fishing Gear **2 credits**

Classification of fishing gears, fishing gear materials, terminology and numbering system. Physical and chemical properties of materials. Instruments for gear materials testing. Calculation and analysis of fishing plans.

Practicals: Care and Maintenance of gears, testing fishing gear materials.

PSS 363 Fish Population Dynamics **2 credits**

History of the theory of fish population dynamics. Basic laws of population dynamics. Biological principles of the mathematics of the fish population dynamics. Basic methods and biological principles of forecasting. Trends of changes in population structure. Food supply and food relationship of fish. Fecundity, quality of the sex products, and course of spawning. Growth and sexual maturation. Total and natural mortality. Effects of fishing. Principles of raising the productivity of fish population.

PSS 364 Fisheries Meteorology **2 credits**

Elements of atmospheric phonomena, atmospheric pressure, temperature, humidity, evaporation, clouds, wind, etc. Fundamental pressure systems, air masses, formation of fronts and associated weather. Weather analysis and forecasting for mariner. Meteorological instruments, weather maps and analysis. Air sea interactions, climatic effects to living marine resources.

PSS 365 Coastal Aquaculture I **3 credits**

Site selection, design and construction of shore facilities. Various farming techniques (intertidal, sublittoral, seabed, floating cages, etc.). Productivity of brackishwater ponds. Food and feeding habits of brackishwater species. Biology and culture of marine species. Shellfishes, seaseeds, etc.

PSS 371 Fishing Methods **2 credits**

Principles and operational theory of inshore and offshore fishing gear. Design and construction of gears. Vessels deck arrangement and ancilliary gears. Gear comparison and modern trends in methods of operation.

PSS 372 Research Methods and Statistics **2 credits**

Tabulation and analysis of research data. Hypothesis testing. Basic experimental designs. Techniques of taking samples and conducting surveys. Introduction to computer programming. Techniques of presenting research results in scientific papers.

PSS 373 Fishing Operations **2 credits**

Shipboard work and applied fishing operations. Fishing operations with inshore and offshore gears.

PSS 374 Fishing Gear Technology **2 credits**

Hydrodynamics of fishing gears; design of fishing gears; comparison law for the design of fishing gears, limitations of model experimental data. Theory and calculations to suit vessel power requirements to fishing gear. Model net experiments.

PSS 375 Fishing Port and Vessel Management **2 credits**

Fishing ports and harbours; facilities; flow of operations; management of harbours, traffic systems. Economics and management of fishing vessels. Ergonometrics of fishing vessels and systems.

PSS 376 Fishing Instrumentation and Electronics **2 credits**

Basic electric and electronic systems. Design of simple electrical and electronic components. Printed circuits. Study of principles, operations, installation, maintenance and of limitations of echo sounders, net sounders, sonars and other fish detection equipment. Theory of fish attraction.

PSS 381 Freshwater Aquaculture I **3 credits**

Soil-types, formation, structure, chemistry and classification. Site selection; layout of a fish farm; design and construction of fish ponds. Fertilizers-organic and inorganic and their application in fish culture. Management of fish ponds; weeds, pests and predators. Cultivated species and their cultural techniques. Food and food habits of cultivated species. Stocking rates and production. Culture of organisms other than fish – frogs, crocodiles, etc. Harvesting and post-harvest technology of cultivated organisms.

PSS 382 Project and Seminar **5 credits**

Each student will work under the direction of a member of the Faculty or any other approved supervisor. He will select topic which are problem orientated and the results will be presented in thesis form and will be critically examined by approved examiner/examiners. He will also be required to present a seminar on the project.

PSS 383 Resource Evaluation Management **3 credits**

Part A: **Economic Resource Evaluation**

1. **Marine Resource Use Alternatives**
   - (a) Range of water resource requirement: different requirements of society for water-agriculture, fisheries water supply, urban and industrial need, recreation, etc.
   - (b) Extent of fisheries activity: artisanal fisheries, offshore fisheries, brackish water fisheries, aquaculture, fisheries potential.
   - (c) Marine resource use and management legislation – brief review of legislation (national and international) which relates to marine resource use, management and development.

2. **Biological Basis for Fisheries Planning**
   - (a) Quantitative component effects on growth factors such as:
     1. Genetics
     2. Fertility
     3. Temperature
     4. pH requirement
     5. Other management factors-diseases, pests, etc.
   - (b) Constraints due to husbandry practices.
   - (c) Constraints due to technology eg. fishing gear, boat sizes.
   - (d) Quantitative synthesis of (a) and (b) on fish growth – therefore, yield.

3. **Economics Basis for Fisheries Planning**
   - (a) Concept of a resource – with application to marine resources in Malaysia.
   - (b) Economic approaches to resource allocation – the use and choice of criteria.
   - (c) Development of decision criteria – especially on B/C, PNW, IRR.

4. **Project Evaluation**

   Preparation of project paper, synthesizing the elements.

Part B: **Biological Resource Management**

Total populations. Carrying capacity, productivity and growth. Fish production, plumpness of fish, estimation of production. Age and growth. Length-weight relationships. Stocking rates. Yield model in fishery management. Optimum sustainable yield and its application to fisheries. Mathematical formulations of different parameters for fish management. Mangrove swamp management. Sea management and the problem related to local fishery management. Management of inland fisheries.

PSS 461 Fish Taxonomy **2 credits**

Origin and evalution of fishes; major groups of living fishes; characterisation of living fish groups; methods and procedures of identifying local fishes.

PSS 462 Nautical Science II 2 credits

Shiphandling, deck equipment, basic hydrography. Basic naval architecture, fishing vessels construction. Ship's stability includes hydrostatic and stability informations.

Spherical trignometry and celestial navigation.

PSS 463 Fishery Resource Management 2 credits

Fish population analysis – species/stock identification, estimate of fish population, abundance, mortality, growth, recruitment and predicting yields. Modeling – logistic model and its development, analytic models. Management of fish populations and their food supply based on the biology of individual species – stream fisheries, lake and reservoir fisheries, herring fisheries, tuna fishery, whale fishery, molluscan fisheries, crustacean fisheries, etc.

PSS 464 Biology of Marine Invertebrates 2 credits

Comparative study of life-history, anatomy and physiology including structural and functional adaptations of selected marine invertebrates. Comprehensive survey of local marine in vertebrates, field collection and identification.

PSS 471 Biological Oceanography 2 credits

Distribution of plankton and nutrients; autotrophic and heterotrophic processes; feeding processes and food requirements of zooplankton; biological cycle, distribution, taxonomy, habitat, chemical composition and production of benthos; effects of pollution on marine organism.

PSS 472 Physical Oceanography 2 credits

Physical properties of sea water. Geographic and hydrodynamic aspects of oceanography. The geography of ocean basins. Observed distributions of temperature, salinity, currents and water masses. The hydrodynamic equations. Ocean currents, wind driven currents and thermohaline circulation. Wave motion and tides of the oceans. The turbulent diffusion and mixing of water masses. Heat budget of the oceans. The estuarine and coastal oceanography.

PSS 473 Fish Physiology 2 credits

Selected topics in fish physiology, with emphasis on the experimental approach. Reproductive and growth endocrinology and their applications in fish physiology, effects of environment on physiology of fish and their adaptations to the environment, behavioural aspects – learning and memory, orientation and fish migrations.

PSS 474 Deck Machinery 2 credits

Introduction to hydraulics. Study of hydraulic systems. Design of common hydraulic component. Design and installation of fishing and deck equipments and machinery. Operation and maintenance of deck and fishing machineries.

PSS 475 Coastal Aquaculture II 2 credits

Improvements through artificial selection. Control breeding and seed production. Marine hatchery technique. Potential species. Pests and predators. Problems and their solutions in mariculture. Recent advances in materials and techniques. Project/seminar to be presented.

PSS 481 Freshwater Aquaculture II 2 credits

Introduction to the concept of Aquaculture – Agriculture integrated farming system and a review of their current practices. Fish culture in padi-fields, reservoirs, canals, rivers, mining pools and other public water bodies. Sewage-fed fisheries. Levels and patterns of Aquaculture Industry – small scale rurual aquaculture and aquaculture as large-scale industry and their related problems. Further practices in induced breeding. Special problems; project and/or seminar.

PSS 482 Limnology 2 credits

Morphometry/morphology. Data processing and interpretaion. Pollution studies. Quantitative sampling techniques; biomass estimate; chlorophyll, etc. Bioassay techniques and interpretaion. Advanced water analysis techniques/procedures. Water shed studies and information survey from government/private bodies. Community/population studies. Energy-flow. Special project and write-up /seminar.

PSS 483 Chemical Oceanography and Mariane Pollution 2 credits

The chemical nature of the ocean. Chemical characteristics of sea water. The chemical processes that occur in the sea water. Air-sea, water-biosphere and water-sediment interface transfer of matter. Salinity, major and minor elements, dissolved and particulate organic carbon in the sea water. The carbonate system of sea water. Marine pollution. The chemistry of pollutants in sea water. Effects of pollutants on marine organisms. Radiation and thermal pollution. Pollution on coral reefs. Coastal pollution control.

PSS 484 Fish Diseases II **2 credits**

General pathology, microbiology, and parasitology as a broad introduction to concepts on fish diseases. Etiology, clinical signs, pathogenesis, laboratory diagnosis, treatment and control of common bacterial, fungal, viral and parasitic diseases with emphasis on local freshwater and marine fishes. Diseases of unknown etiology, miscellaneous conditions, nutritional deficiency, effects of pollution and mass mortalities.

附　録　一　(4)

付録(4)

UNIVERSITIES AND UNIVERSITY COLLEGES ACT, 1971

(Section 6)

UNIVERSITI PERTANIAN MALAYSIA (INCORPORATION) ORDER, 1971

WHEREAS section 6 of the Universities and University Colleges Act, 1971 *Act 30.* provides that the Yang di-Pertuan Agong, may, if he is satisfied that it is expedient in the national interest that a University should be established, by order establish the University in accordance with subsection (1) of that section:

AND WHEREAS the Yang di-Pertuan Agong is satisfied that a University should be established;

NOW THEREFORE by virtue of the powers conferred upon him by section 6 (1) of the Act, the Yang di-Pertuan Agong hereby makes the following order:

Citation. 1. This order may be cited as the Universiti Pertanian Malaysia (Incorporation) Order, 1971.

Incorporation. 2. *(a)* There shall be a higher educational institution having the status of a University, which shall be a body corporate, for the purpose of providing, promoting and developing, higher education in the fields of Agriculture, Forestry, Veterinary Science, Natural Sciences, Engineering Sciences, Technology, Social Sciences, Humanities and Education as well as to provide for research and the accumulation and advancement of knowledge and the dissemination of such knowledge in the aforesaid fields of study:

(b) The aforesaid higher educational institution shall be known by the name and style "Universiti Pertanian Malaysia"; and

(c) The site of the aforesaid Universiti Pertanian Malaysia (which shall be the seats of the University) shall be located at lot Nos. 3261, 290, 1698, 2580, 5379, GN. 2399 and AA/5/63 in the Mukim of Petaling, in the District of Kuala Lumpur, in the State of Selangor and at lot Nos. 6306, 5664, 5269, 5270, 7128 and 7407 in the Mukim of Kajang, in the District of Ulu Langat, in the State of Selangor.

Made this 4th day of October, 1971.
[K.P.Sulit 10030 Jld. II; PN. (PU^2.) 75.]

By Command,

HUSSEIN ONN,
Minister of Education

UNIVERSITIES AND UNIVERSITY COLLEGES ACT 1971

(Section 8)

CONSTITUTION OF THE UNIVERSITY AGRICULTURE MALAYSIA

Act 30. IN pursuance of the powers conferred by section 8 of the Universities and University Colleges Act 1971, the Yang di-Pertuan Agong has appointed the 1st day of January 1977 as the date on which the provisions of the Constitution of the University Agriculture Malaysia established under the Universiti Pertanian Malaysia (Incorporation) Order 1971, as specified in the Schedule to the Act as exempted, varied or added by virtue of section 26 of the Universities and University Colleges Act 1971, shall be deemed to have effect.

P.U. (A) 387/71.

Transitional provisions to cease to have effect. *P.U. (A) 407/71.* The Transitional Provisions as provided for by the Yang di-Pertuan Agong pursuant to section 18 of the Universities and University Colleges Act 1971, with respect to the University *vide* P.U. (A) 407/71 shall cease to have effect.

Citation. 1. This Constitution may be cited as the **Constitution of the University Agriculture Malaysia.**

Interpretation. 2. (1) In this Constitution, unless the context otherwise requires—

"Act" means any Act made in accordance with this Constitution or any Statute;

"Faculty" means a Faculty established under section 18;

"Teacher" means a person appointed to be a teacher by the Council in accordance with this Constitution, and includes a Professor, Reader, Associate Professor, Lecturer and Assistant Lecturer;

"Foundation Day" means the 4th day of October 1971, the date on which the Incorporation Order made by the Yang di-Pertuan Agong under section 6 of the Universities and University Colleges Act 1971 comes into force;

"Court" means the Court of the University constituted in accordance with section 13;

"Convocation" means a Convocation held in accordance with section 44;

"Council" means the Council of the University constituted in accordance with section 15;

"Officer" means the Chancellor, Pro-Chancellor, the Vice-Chancellor, the Deputy Vice-Chancellor, the Dean of a Faculty, the Registrar, the Bursar, the Chief Librarian, the Director of Farms, or the holder or any office created by Statute;

"Regulation" means any regulation made by any Authority or officer or other body of the University in accordance with the provisions of this Constitution of any Statute or Act;

"Guild of Graduates" means the Guild constituted in accordance with section 22;

"Authority" means any of the Authorities of the University referred to in section 12, and includes any Authority established by Statute;

"Centre" means a Centre established under section 18;

"Senate" means the Senate of the University constituted in accordance with section 17;

"Statute" means any Statute made in accordance with this Constitution;

"The University" means Universiti Pertanian Malaysia;

"Institution" means a department or other body established under section 18.

(2) References in this Constitution to a section are reference to a section of this Constitution.

PART I
THE UNIVERSITY

Establishing of University as body corporate.

3. There is hereby established in accordance with the provisions of this Constitution, a University with the name and style of "Universiti Pertanian Malaysia" by which name and style the Chancellor, the Pro-Chancellors, the Vice-Chancellor, and the members for the time being of the Court, the Council and the Senate are hereby constituted a body corporate with perpetual succession, and with full power and authority under such name—

(a) to sue and be sued in all courts;

(b) to have and use a common seal and from time to time to break, change, alter and make anew such seal as it shall think fit;

(c) for the purposes of this Constitution, and subject to the Statutes, Acts and Regulations to purchase any property, movable or immovable, and to take, accept and hold any such property which may become vested in it by virtue of any such purchase, or by any exchange, grant, donation, lease, testamentary disposition or otherwise;

(d) to sell, mortgage, lease, exchange or otherwise dispose of any such property; and

(e) to exercise and perform, in accordance with the provisions of this Constitution and of the Statutes, Acts and Regulations, all powers and duties conferred or imposed upon the University by such provisions.

Powers of University.

4. (1) The University shall, subject to the provisions of this Constitution, have the following powers—

(a) to provide courses of instruction, to hold examinations, to make provision for research, and to take such other steps as may appear necessary or desirable for the advancement and dissemination of knowledge;

(b) to confer degrees and diplomas including external degrees and diplomas upon persons who have followed courses of study approved by the University and have satisfied such other requirements as may be prescribed by Act;

(c) to recognize the degrees and diplomas of other institutions of higher learning for the purpose of admission to the courses and examinations of the University and of the award of higher degrees on holders of such degrees or diplomas or on graduates of the University on such conditions as may be prescribed by Act;

(d) to confer degrees upon teachers of the University who have satisfied such requirements as may be prescribed by Act;

(e) to confer honorary degrees on persons who have contributed to the advancement or dissemination of knowledge or who have rendered distinguished public service;

(f) to grant certificates to persons who have attained proficiency in any branch or branches of knowledge;

(g) to institute professorships, lectureships, and other posts and offices, and to make appointments thereto;

(h) to establish a University printing press and to publish books and other matter;

(i) to erect, equip and maintain libraries, laboratories, museums, lecture halls, halls of residence and all other buildings required for the purposes of the University, whether in the Federation or elsewhere;

(j) to institute and award fellowships, scholarships, exhibitions, bursaries, medals, prizes and other titles, distinctions, awards and other forms of assistance towards the advancement and dissemination of knowledge;

(k) to invest in land or securities (whether authorised as trustee investment or not) such funds as may be vested in it for the purpose of endowment, whether for general or special purposes, or such other funds as may not be immediately required for current expenditure, with power from time to time to vary any such investment and to deposit any moneys for the time being uninvested with any bank established in Malaysia either upon fixed deposit or upon current account;

(l) to enter into contracts, to appoint such staff and to establish such trusts, as may be required for the purposes of the University;

(m) to appoint, promote and discipline officers, teachers and staff of the University;

(n) to regulate the conditions of service of the staff of the University, including schemes of service, salary scales, leave and discipline;

(o) to establish pension or superannuation or provident fund schemes for the benefit of its employees, and to enter into arrangements with other organisations or persons for the establishment of such schemes;

(p) to regulate and provide for the residence of officers, teachers, staff and students of the University and the welfare and discipline of teachers, staff and students;

(q) to demand and receive such fees as may from time to time be prescribed by Act; and

(r) to do all such acts and things, whether or not incidental to the powers aforesaid as may be requisite in order to further instruction, research, finance, administration, welfare and discipline in the University.

(2) If the Yang di-Pertuan Agong is satisfied, with a view to maintenance and promotion of the Federation's foreign relations, that it is necessary to confer an honorary degree upon a foreign dignitary, on the direction by the Yang di-Pertuan Agong the University shall confer such degree as stated in the direction.

Distinctions of race and creed prohibited.

5. Subject to the provision of Article 153 of the Federal Constitution, membership of the University, whether as an officer, teacher or student, shall be open to all persons irrespective of sex, race, religion, nationality or class; and no test of religious belief or profession shall be adopted or imposed in order to entitle any persons to be admitted to such membership or to be awarded any degree or diploma of the University, nor shall any fellowship, scholarships, exhibition, bursary, medal, prize or other distinction or award be limited to persons of any particular race, religion, nationality or class if the cost of the same is met from the general funds of the University.

The seal of the University.

6. (1) The common seal of the University shall be such seal as may be approved by the Chancellor on the recommendation of the Council and such seal may in like manner from time to time be broken, changed, altered and made anew.

(2) The common seal fo the University shall ke kept in the custody of the Vice-Chancellor.

(3) The common seal of the University shall not be affixed to any instrument other than a degree, diploma or certificate except in the presence of–

(a) The Vice-Chancellor; and
(b) one other member of the Council,

who shall sign their names to the instrument in token of such presence; and such signature shall be sufficient evidence that such seal was duly and properly affixed and that the same is the lawful seal of the University.

(4) The common seal of the University shall be affixed to a degree, diploma or certificate in the presence of–

(a) The Vice-Chancellor; and
(b) the Registrar,

who shall sign their names to the instrument in token of such presence, and such signature shall be sufficient evidence that such seal was duly and properly affixed and that the same is the lawful seal of the University.

(5) The seal of the University shall be officially and judicially noticed.

(6) Any document or instrument which (if executed by a person not being a body corporate) will not require to be under seal may in like manner be executed by the University provided that such document or instrument shall be executed on behalf of the University by an officer or any person generally or a specially authorised by the Council on their behalf and provided further that the name of such officer or person so authorised is duly gazetted.

PART II

THE OFFICERS OF THE UNIVERSITY

The Chancellor.

7. (1) There shall be a Chancellor who shall be the Head of the University and shall preside when present at–

(a) meetings of the Court;
(b) meetings of the Council; and
(c) any Convocation,

and shall have such other powers and perform such other duties as may be conferred or imposed upon him by this Constitution or any Statute, Act or Regulation.

(2) The Chancellor shall be appointed by the Yang di-Pertuan Agong for such period, not exceeding seven years, as may be specified by the Yang di-Pertuan Agong.

(3) The Chancellor may by writing under his hand addressed to the Yang di-Pertuan Agong resign his office, or he may be removed by the Yang di-Pertuan Agong.

(4) A person shall be eligible for reappointment to the office of Chancellor.

The Pro-Chancellors.

8. (1) The Chancellor may appoint such persons to be Pro-Chancellors as he may consider proper.

(2) If for any reason the Chancellor is unable to exercise any of his functions under this Constitution or any Statute, Act or Regulation, he may authorise any of the Pro-Chancellors to exercise such functions on his behalf.

(3) Every Pro-Chancellor shall hold office during the pleasure of the Chancellor.

The Vice-Chancellor and Deputy Vice-Chancellor.

9. (1) There shall be a Vice-Chancellor who shall be appointed by the Yang di-Pertuan Agong acting on the advice of the Minister given after consultation with the Council.

(2) The Vice-Chancellor shall be the principal executive and academic officer of the University.

(3) It shall be the duty of the Vice-Chancellor to see that the provisions of this Constitution and the Statutes, Acts and Regulations are observed, and he shall have all such powers as may be necessary for this purpose and, in particular, to ensure that every Authority or committee keeps within its powers or terms of reference.

(4) The Vice-Chancellor shall, subject to the provisions of this Constitution, exercise general supervision over the arrangements for instruction, research, finance, administration, welfare and discipline in the University, and may exercise such other powers as may be conferred upon him by this Constitution and any Statute, Act or Regulation.

(5) The terms of office and other conditions of service of the Vice-Chancellor shall be determined by the Yang di-Pertuan Agong acting on the advice of the Minister given after consultation with the Council, and shall be binding on the University.

(6) There shall be at least one Deputy Vice-Chancellor; the Deputy Vice-Chancellor or Deputy Vice-Chancellors, as the case may be, shall be appointed by the Minister after consultation with the Vice-Chancellor, and any fit and proper person may be so appointed either from within or without the University; and terms of office and other conditions of service of a Deputy Vice-Chancellor shall be determined by the Minister after consultation with the Vice-Chancellor, and shall be binding on the University.

(7) If for any substantial period the Vice-Chancellor is unable by reason of illness, leave or absence or any other cause to exercise any of the functions of his office, the Deputy Vice-Chancellor or, if there is more than one Deputy Vice-Chancellor, such one of them as may be nominated by the Minister shall exercise such functions; and in the event of the absence or disability of the Deputy Vice-Chancellor or all the Deputy Vice-Chancellors (if there be more than one) the Minister shall make such temporary arrangements as he may think fit for the exercise of such functions.

Registrar, Bursar, Chief Librarian and Director of Farms.

10. (1) There shall be a Registrar, a Bursar, a Chief Librarian and a Director of Farms who shall be whole-time officers of the University and shall have such powers and duties as may be prescribed by Statute.

(2) The Registrar, the Bursar, the Chief Librarian and the Director of Farms shall be appointed by the Council on the advice of the Boards of Selection.

(3) Subject to the provisions of this Constitution, the terms of office and other conditions of appointment of the Registrar, the Bursar, the Chief Librarian and the Director of Farms shall be determined by the Council.

Other Officers.

11. The University may appoint such other officers or servants as may be prescribed by Statute.

PART III

THE UNIVERSITY AUTHORITIES

The Authorities.

12. (1) The Authorities of the University shall be the Court, the Council, the Senate, the Faculties, the Institutions, the Centres, the Boards of Studies, the Boards of Selection, the Board of Student affairs, and such other bodies as may be prescribed by Statute as Authorities of the University.

(2) Subject to the provisions of this Constitution, the composition, powers and procedure of the Authorities shall be prescribed by Statute.

The Court.

13. The Court shall consist of–

(a) the Chancellor;
(b) the Pro-Chancellors;
(c) the Vice-Chancellor;
(d) the members for the time being of the Council;
(e) the members for the time being of the Senate;
(f) two persons appointed by the Yang di-Pertuan Agong;
(g) thirteen prsons, each Ruler or Governor of a State appointing one person;
(h) if a Guild of Graduates exists, such number of representatives thereof as may be provided by Statute;
(i) two representatives of Parliament and one representative of each of the State Legislatures;
(j) not more than thirty persons appointed by the Chancellor on the recommendation of the Vice-Chancellor being persons representative of professional, commercial, industrial, cultural, teaching, research and learning, medical, educational and other organisations in Malaysia; and
(k) the President and the Secretary for the time being of the Students' Representative Council.

Powers of the Court.

14. The Court shall, subject to the provisions of this Constitution, have power–

(a) to receive an annual report on the University from the Vice-Chancellor;

(b) to receive such special reports as the Council may submit to Court;

(c) to receive the audited annual accounts of the University;

(d) to pass such resolutions relating to any reports or accounts submitted to the Court as the Court may think fit;

(e) to receive copies of all Statutes;

(f) to pass such resolutions relating to any Statute received by the Court as the Court may think fit; and

(g) to exercise such other functions as may be conferred on the Court by Statute.

Council.

15. (1) The Council shall consist of–

(a) a Chairman appointed by the Minister;

(b) the Vice-Chancellor;

(c) two persons appointed by the Yang di-Pertuan Agong;

(d) one person appointed by the Conference of Rulers;

(e) one person appointed by the Sultan of the State of Selangor;

(f) one person appointed by the Chancellor;

(g) two persons elected by the Senate from among its own members;

(h) the Secretary General of the Treasury or his representative;

(i) the Secretary General of the Ministry of Education or his representative;

(j) the Director General of Education or his representative;

(k) the Director General of Public Services or his representaive;

(l) the Solicitor General or his representative; and

(m) two graduates of the University appointed by the Minister on the advice of the Vice-Chancellor.

(2) Where the person appointed by the Minister as Chairman of the Council holds a post in the public service by virtue of which he is also an *ex-officio* member of the Council he shall be separately represented on the Council in his capacity as such *ex-officio* member by his representative.

(3) The Deputy Chairman of the Council shall be appointed by the Chairman from among the members of the Council, and during any absence of the Chairman from any sitting the Deputy Chairman shall preside over the sitting, and, if the Deputy Chairman is also absent, such other member as may be elected by the members present shall sit as Chairman of the Council.

(4) No member of the Council who is a member of the staff of the University shall be eligible to be appointed or to sit as Chairman or Deputy Chairman of the Council.

(5) The Chairman and Deputy Chairman shall vacate the chair on ceasing to be a member of the Council or on becoming disqualified for sitting as Chairman and Deputy Chairman.

(6) A Deputy Vice-Chancellor, if not a member of the Council under subsection (1) may attend meetings of the Council but shall have no vote.

Powers of the Council.

16. The Council shall be the executive body of the University, and may exercise all the powers conferred on the University, save in so far as they are by this Constitution or the Statutes. Acts and Regulations conferred on some other Authority or body or on some officer of the University:

Provided that–

(a) no resolution shall be passed by the Council relating to any matter within the powers of the Senate, unless the Senate has first been given the opportunity of recording and transmitting to the Council its opinion thereon; and

(b) no member of the Council who is a member of the academic staff (other than the Vice-Chancellor) shall take part in the proceedings of the Council when it is holding discussions or making decisions on the appointment, promotion and other matters relating to the service of a member of the academic staff.

The Senate.

17. (1) The Senate shall consist of:

(a) the Vice-Chancellor, who shall be Chairman;

(b) Deputy Vice-Chancellors;

(c) the Deans of Faculties;

(d) the Professors of the University (other than visiting professors); and

(e) such other persons as may be prescribed by Statute;

(2) The Senate shall be the academic body of the University and, subject to the provisions of this Constitution, the Statutes, Acts and Regulations, shall have the control and general direction of instruction, research and examination, and the award of degrees, diplomas and certificates.

(3) In the performance of its duties, functions and responsibilities, the Senate may delegate any of its duties, functions and responsibilities to its members or a committee consisting of its members.

The Faculties Institutions and Centres.

18. (1) The University shall be divided into such number and names of Faculties, Institutions and Centres as may be prescribed by Statute.

(2) A Faculty, Institution or Centre shall be responsible to the Senate for the organisation of instruction in the subject of study within the purview of the Faculty, Institution or Centre, as the case may be, and may exercise such other functions as may be conferred on it by Statute, Act or Regulation.

(3) The Vice-Chancellor shall appoint a Dean in respect of each Faculty and at least one Deputy Dean. The Dean shall be chairman of the Faculty and shall exercise such other functions as may be vested in him by Statute, Act or Regulation; and if owing to his absence on leave or for any other reason the Dean is unable to perform the duties of his office, it shall be lawful for the Deputy Dean to perform such duties of the Dean for such time as such disability may continue.

(4) The Vice-Chancellor shall have power to appoint a person to be head of an Institution or Centre, and such head shall be styled by such title as may be prescribed by Statute, Act or Regulation; and if owing to absence on leave or for any other reason the head of an Institution or Centre is unable to perform his duties, the Vice-Chancellor may, except as otherwise provided by Statute, appoint any person to perform such duties for such time as such disability shall continue.

(5) A Dean, a Deputy Dean or the head of an Institution or Centre appointed under subsection (3) or (4), as the case may be, shall be appointed for a period not exceeding two years, but shall be eligible for re-appointment.

(6) Notwithstanding the provisions of subsection (5), the Vice-Chancellor may, if he deems fit, revoke any appointment made under subsection (3) or (4) at any time during the term of such appointment.

The Board of Studies

19. A Board of Studies may be appointed by the Senate for either of the following purposes–

(a) to deal with matters pertaining to one or more faculties or Institutions or Centres;

(b) to consider proposals referred to it by the Senate for the establishment of a new Faculty, Institution or Centre; and

in either case to report thereon to a Faculty or Faculties or to an Institution or Institutions or Centre or Centres or to the Senate as the case may require.

The Board of Selection.

20. (1) A Board of Selection shall, subject to any Statute, consist of–

(a) the Vice-Chancellor, who shall be chairman;

(b) two members of the Council appointed by the Council;

(c) the Dean or head of the Faculty, Institution or Centre or the Deans or heads of the Faculties, Institutions or Centres (if any) to which the Professorships will be allocated; and

(d) two members of the Senate appointed by the Senate.

(2) Save as provided in subsection (3) the Boards of Selection shall be convened and presided by the Vice-Chancellor.

(3) Whenever it is decided to fill an appointment other than that to a Professorship, the Boards of Selection convened for that purpose shall be presided by the Deputy Vice-Chancellor, or, in his absence, by a member elected by the members present at the meeting.

(4) Where the Deputy Vice-Chancellor is not a member of the Boards of Selection, he shall for the purpose of the meeting in which he presides under subsection (3) and the decision made thereat, be deemed to be a member of the Boards of Selection.

(5) The association of external experts with the making of appointments may be prescribed by Statute.

The Board of Student Affairs.

21. (1) There shall be established a Board of Student Affairs which shall consist of the Vice-Chancellor and such other persons as may be appointed by the Senate.

(2) The Board of Student Affairs shall have such powers as may be prescribed by Statute.

Guild of Graduates.

22. (1) Subject to the approval of the Council, it shall be lawful for not less than thirty graduates of the University to form and establish an association to be known as the Guild of Graduates.

(2) The Guild of Graduates shall be governed and administered in accordance with its constitution and rules made by it and no such constitution and rules so made or any amendments thereto shall come into force unless and until approval thereof shall have first been obtained from the Council.

(3) Nothing in this section shall be construed as constituting the Guild of Graduates to be an Authority of the University or as conferring any power thereon to elect as its representatives to the Council persons who are for the time being employed by the University as members of its academic and non-academic staff.

Term of office of members of Authorities.

23. (1) Except as may be prescribed by this Constitution or by any Statute, the term of office of a person elected or appointed to be a member of an Authority, otherwise than ex-officio, shall be three years:

Provided that–

(a) where the person is elected or appointed because he holds an office or is a member of some other Authority or body, he shall cease to be a member of the Authority if before the expiry of his term of office he ceases to hold such office or to be a member of such Authority or body; and

(b) a person who retires at the end of his term of office shall be eligible for re-election or reappointment if he is otherwise qualified.

(2) Where a person is a member of an Authority ex-officio, a person appointed to act for him shall be a member of the Authority ex-officio so long as he is so acting and is otherwise qualified.

(3) The decisions of an Authority shall be valid notwithstanding any vacancy among its members.

Majority.

24. (1) Subject to the provisions of this Constitution and to any Statutes, Acts or Regulations, a question at any meeting of any Authority shall be decided by a majority of the votes of the members present.

(2) The Chairman and every member shall have and may exercise one vote each, but in the event of an equality of votes the Chairman shall have and may exercise a second or casting vote.

PART IV

STATUTES, ACT AND REGULATIONS

Statutes.

25. Subject to the provisions of this Constitution, Statutes may be made to deal with any or all of the following matters–

(a) the powers and duties of the officers of the University;

(b) the composition, powers, duties and procedure of the Authorities of the University;

(c) the methods of appointment and the conditions of service of the officers and teachers of the University, except in relation to their discipline;

(d) the determination of the degrees, diplomas and other academic distinctions to be conferred by the University;

(e) the conditions of admission and of residence and welfare of students;

(f) the management of the library;

(g) the management of farms;

(h) all other matters which under this Constitution may be regulated by Statute; and

(i) matters incidental to or consequential upon any of the matters aforesaid.

Procedure on making, amending or revoking statutes.

26. (1) The Chancellor may, subject to the provisions of this section, make, revoke or amend any Statute.

(2) The proposal for the making of any new Statute or the revocation or amendment of any Statute, shall be prepared by the Council.

(3) A proposal for a new Statute, or of any amendment to a Statute, dealing with any of the following matters, that is to say–

(a) the powers and duties of the Dean of a Faculty or the Head of an Institution or Centre;

(b) the composition, powers, duties and procedure of the Senate, a Faculty, an Institution, a Centre, a Board of Studies, Boards of Selection, or the Board of Student Affairs;

(c) the determination of degrees, diplomas, and other academic distinctions to be conferred by the University;

(d) the methods of appointment and the conditions of service of teachers;

(e) the conditions of residence and the welfare of students;

(f) the management of the library;

(g) the management of the farms; and

(h) all other matters within the jurisdiction of all the Senate under this Constitution or any Statute,

shall not be submitted to the Chancellor until it has been referred to the Senate and the Senate has reported to the Council its observations thereon.

(4) Every Statute made under this section shall be laid on the table at the next meeting of the Court then following the making of such Statute.

Acts.

27. Subject to the provisions of this Constitution and the Statute, Acts may be made for all or any of the following matters–

(a) the principles governing the award of degrees diplomas and other academic distinctions;

(b) the number and scope of examinations;

(c) the appointment, powers, duties, remuneration and conditions of service of examiners and the conduct of examinations;

(d) the admission of students to the examinations, degree and diploma courses of the University and to residence in the University;

(e) the methods of appointment and the conditions of service of persons in the employment of the University, except in relation to their discipline;

(f) the establishment and regulation of pension, superannuation and provident fund schemes for the benefit of the employees of the University or any section of them;

(g) the conditions of residence and the welfare of students;

(h) the fees to be charged for courses of study, for residence, for admission to examination, for degrees and diplomas, and any other fees that may be levied by the University;

(i) the management of the lecture halls, the laboratories, research institutes, halls of residence, and all branches of University activity not specifically provided for in this Constitution or by Statute;

(j) The constitution, powers and duties of any Board, committee or other body not specifically provided for in this Constitution or by Statute;

(k) all matters which by this Constitution or any Statute may be prescribed by Act; and

(l) all matters within the powers of the University and not otherwise provided for by this Part of this Constitution.

Procedure on making, amending or revoking Acts.

28. (1) The Council may, subject to the provisions of this section, make, amend or revoke any Act.

(2) The draft of any Act dealing with–

(a) any matter referred to in paragraphs (a), (b), (c), (d) and (i) of section 27; or

(b) any matter within the jurisdiction of the Senate,

may be proposed by the Senate; and the Council may approve the draft or refer it back to the Senate with observations or proposals for amendment.

Regulations.

29.(1) The Court, the Council and the Senate may each make regulations for its own procedure.

(2) The Council may after consulting the Senat make regulations for the procedure of Boards of Selection.

(3) The Senate may make regulations for the procedure of a Faculty, Institution, Centre or Board of Studies, or of any other board or committee subject to the jurisdiction of the Senate.

(4) The Senate may make regulations prescribing courses of study or syllabuses of examinations.

(5) Regulations may be made by any Authority if it is so empowered by this Constitution, Statute or an Act.

Publications of Statutes, Acts and Regulations.

30.(1) When any new Statute or Act is made, amended or revoked every such Statute, Act, amendment or revocation shall within one month after the same shall have been made or done be published in the *Gazette* and in such other manner as the Council may direct.

(2) The Statutes, Act and Regulations of the University as amended from time to time shall be published in book form at such intervals as the Council may direct, and copies shall be made available for purchase at a reasonable price by members of the public.

(3) Nothing in this section shall apply to—

(a) any Act or Regulation containing only instruction to examiners or invigilators; or

(b) any Act or Regulation which the Council resolves not to publish.

Constitution, inconsistencies between the Statutes, etc.

31. In the event of—

(a) any Statute being inconsistent with the provisions of this Constitution; or

(b) any Act being inconsistent with the provisions of this Constitution or any Statute; or

(c) any regulation being inconsistent with the provisions of this Constitution or any Statute or Act,

then the provisions of the Constitution, Statute or Act, as the case may be, shall prevail, and such Statute, Act or Regulations, as the case may be, shall to the extent of the inconsistency be void.

PART V

FINANCIAL PROVISIONS

Standing Finance Committee.

32. The Council shall appoint a Standing Finance Committee for regulating and controlling the finances of the University.

Preparation of Estimates.

33. It shall be the duty of such officer or officers of the University as may be prescribed by Statute to prepare for the consideration of the Vice-Chancellor the estimates of income and expenditure of the University for each financial year.

Financial year.

34.(1) For the purposes of this Part the financial year shall be the calendar year or such other period as the Council may determine.

(2) The accounts of the Council shall, as soon as may be, be balanced for the preceding financial year and an annual statement or abstract thereof shall be prepared.

(3) The annual statement or abstract referred to in subsection (2) shall be prepared in such form and shall contain such information as the Council may from time to time direct.

Annual Estimates.

35.(1) The Council shall, not less than four months before the end of the financial year, approve detailed estimates of revenue and expenditure of the University for the next financial year and present such estimates, together with the comments of the Council thereon, to the Minister.

(2) Before the date fixed for the meeting of the Council for the purpose of approving such estimates the Standing Finance Committee shall prepare draft estimates for submission to the Council, and the copy of such estimates shall be delivered to each member of the Council not less than seven days before the date fixed for such meeting.

(3) The Council may, subject to the provisions of subsection (1), in its discretion approve, modify or reject all or any of the items appearing in such draft estimates or refer any item back to the Standing Finance Committee for its consideration or add any item thereto.

Supplementary estimates.

36. Where additional financial provision is required in any year the Council may from time to time approve supplementary estimates for the purpose of showing the sources from which any additional expenditure incurred by it may be met.

No expenditure to be incurred unless included in the estimates.

37.(1) The Council shall not incur any expenditure which has not been included in any approved estimates.

Provided that subject to the provisions of this Constitution the Council may transfer all or any part of the money assigned—

(a) to one item of annually recurrent expenditure to another item of annually recurrent expenditure;

(b) to one item of capital expenditure to another item of capital expenditure;

(2) The provisions of subsection (1) shall not apply to—

(a) moneys deposited with the University by any person, wherever by the conditions of such deposit any such sum has become repayable;

(b) moneys collected and credited to the Funds of the University in error;

(c) moneys payable by the University under any judgment or order of court;

(d) moneys expended by the University in instituting or defending legal proceedings; and

(e) expenditure arising out of any property or moneys referred to in section 39.

Form of estimates.

38. The annual and supplementary estimates shall be prepared in such form and shall contain such information as the Council may direct, and shall show in separate parts the annually recurrent expenditure and the capital expenditure of the University.

Power of the Council to accept gifts.

39. (1) The Council may on behalf of the University accept by way of grant, gift, testamentary disposition or otherwise, property and moneys in aid of the finances of the University on such conditions as it may determine.

(2) Registers shall be kept of all donations to the University including the names of donors to the University and any special conditions on which any donation may have been given.

Property given for specific purposes to be separately accounted for.

40. All property, moneys or funds given for any specific purposes shall be applied and administered in accordance with the purposes for which they may have been given and shall be separately accounted for.

Form of contracts.

41. Any contract involving the expenditure by the University of more than five thousand dollars shall be in writing, signed on behalf of the University by a person acting under the express or implied authority of the University:

Provided that any contract (other than a contract referred to in subsection (3) of section (45) involving expenditure by the University of more than ten thousand dollars, and any contract which if made between private persons would be required by law to be under seal shall be executed by affixing thereto the common seal of the University.

Dividends prohibited.

42. No dividend or bonus shall be paid and no gift or division of money shall be made by or on behalf of the University to or among any of its members except by way of prize, reward or special grant or under any provident scheme.

Audit.

43. (1) The accounts of the University shall be audited annually by auditors appointed by the Council.

(2) The audited accounts, with any observation made thereon by the auditors, shall be presented to the Court at its next meeting.

PART VI

GENERAL PROVISIONS

Convocation.

44. (1) A Convocation for the conferment of degrees shall be held annually, or as often as the Chancellor may direct, on such date as may be approved by the Chancellor.

(2) In the absence of the Chancellor or of a Pro-Chancellor, authorised for this purpose by the Chancellor, the Vice-Chancellor shall preside over Convocation.

(3) The procedure of Convocation shall be prescribed by Act, but no such Act shall be made until the Chancellor has been consulted about its terms.

Appointments of teachers and employees.

45. (1) All persons employed or to be employed by the University as teachers, the Registrar, the Bursar, the Chief Librarian or the Director or Farms shall be appointed as such by the Council on the advice of the Boards of Selection.

(2) All persons employed or to be employed by the University other than those mentioned in subsection (1) shall, subject to any Act, be appointed by the Council.

(3) Every person employed by the University shall hold office on such terms and conditions as may be prescribed by the Council and the terms and conditions to be so prescribed shall be deemed to include a provision—

(a) in relation to teaching, examining, invigilating and other similar duties, that his employment is subject to the provisions of this Constitution and to the provisions of all Statutes, Acts and Regulations as from time to time amended; and

(b) in relation to all other terms and conditions of service that his employment is subject to the provisions of this Constitution and to the provisions of all Statutes, Acts and Regulations in force on the date of the commencement of his employment.

(4) Nothing in this section shall prevent the Council from entering into a special contractual arrangement with a person to be so employed by the University if it is in the opinion of the Council expedient so to do.

Royal Professors.

46. (1) Notwithstanding the provisions of sections 20 and 45, the Yang di-Pertuan Agong may, after consultation with the Chancellor, from time to time appoint persons of exceptional academic distinction to be professors of the University:

Provided that the number of persons so appointed shall not at any time exceed three in number.

(2) Any person appointed under subsection (1) shall be known as a Royal Professor and—

(a) shall hold office upon such terms and conditions as the Chancellor with the approval of the Yang di-Pertuan Agong may deem appropriate; and

(b) subject to the terms of his appointment and to any direction by the Chancellor, shall have all the powers and perform all the duties conferred or imposed upon professors by this Constitution, and any Statute, Act and Regulation made thereunder.

All appointments to be subject to the Universities and University Colleges Act 1971 and any subsidiary legislation thereunder. *Act 30.*

46A. Notwithstanding the provisions of sections 45 and 46 or any other provision of this Constitution, every person employed by the University, including professors appointed under section 46, shall hold office subject to the provisions of the Universities and University Colleges Act 1971 and any subsidiary legislation made thereunder, including rules made under section 16C thereof, and the terms and conditions of their employment or appointment shall be deemed to include a provision to this effect.

Admission of students.

47. A student shall not be admitted to the University to a course of study unless he shall have satisfied such requirements as may be prescribed by Act:

Provided that, except with agreement of the Minister, students who have been awarded Federal or State scholarships, loans or other similar financial assistance from public funds for a course of study, shall not be refused admission if they satisfy such requirements.

The Students' Representative Council.

48. (1) The registered students of the University, other than external students, shall together constitute a body to be known as the Persatuan Pelajar-pelajar Universiti (hereinafter in this Constitution referred to as "the Persatuan").

(2) The Persatuan shall elect a Students' Representative Council (hereinafter in this Constitution referred to as "the SRC") in the following manner:

(a) the registered students of each Faculty, of each Institution and of each Centre (where such Institution or Centre does not belong to any Faculty) shall elect by secret ballot conducted by the Dean of the Faculty or the head of the Institution or Centre, as the case may be, such uniform number of registered students of the respective Faculty, Institution or Centre to be representatives in the SRC as may be determined by the Vice-Chancellor; and

(b) the registered students as a whole shall elect by secret ballot conducted by the Registrar of the University such number of registered students to be representatives to the SRC as may be determined by the Vice-Chancellor, being, in any case, not more than half of the number of representatives elected under paragraph *(a)*.

(3) The SRC shall elect from among its members a President, a Vice-President, a Secretary and a Treasurer, who shall be its only office-bearers, unless otherwise authorised in writing by the Vice-Chancellor; the office-bearers so authorised by the Vice-Chancellor shall be elected by the SRC from the members of the SRC.

(4) The members of the SRC and its office-bearers shall be elected for one year.

(5) The SRC's decisions shall be taken by a majority vote with not less than two-thirds of the members being present and voting.

(6) The SRC may form from time to time, with the prior approval in writing of the Vice-Chancellor, *ad hoc* committees from among its members for specific purposes or objects.

(7) No student against whom disciplinary proceedings are pending, or who has been found guilty of a disciplinary offence, shall be elected or remain a member of the SRC or an office-bearer of any student body or committee, unless authorised in writing by the Vice-Chancellor.

(8) A student who has not yet appeared for his first examination in the University for his course of studies, or who has failed, or did not appear for, the last examination held by the University for his course of studies immediately prior to any proposed election or elections to the SRC or by the SRC or to or by any other sutdent organisation or body, shall be disqualified from being elected at such election or elections.

(9) Nothing in this section shall preclude any graduate, who is registered as a student for a higher degree or a post-graduate diploma, from becoming an associate member of the Persatuan.

(10) The objects and functions of the SRC shall be—

(a) to foster a spirit of corporate life among the students of the University;

(b) to organize and supervise, subject to the direction of the Vice-Chancellor, student welfare facilities in the University including recreational facilities, spiritual and religious activities, and the supply of meals and refreshments;

(c) to make representations to the Vice-Chancellor on all matters relating to, or connected with, the living and working conditions of the students of the University;

(d) to be represented on any body which may, in accordance with an Act made by the Council for the purpose, be appointed to undertake student welfare activities in the University; and

(e) to undertake such other activities as may be determined by the Council from time to time.

(11) The Persatuan or the SRC shall not maintian any fund or make any collection of any money or property from any source whatsoever, but such reasonable expenses as the SRC may be authorised in advance in writing by the Vice-Chancellor to incur may be paid by the University where reasonable written claims supported by receipts and vouchers are submitted by the SRC to the Vice-Chancellor and are approved by the Vice-Chancellor.

(12) The Treasurer shall keep proper accounts of the SRC and not later than three months after the end of every financial year, being a financial year as specified by the Vice-Chancellor, a copy of the said accounts which shall be audited by a person appointed by the Council shall be submitted by the SRC for approval to the Council.

(13) The SRC shall hold meetings from time to time as it may deem necessary and it shall be the duty of the Secretary to keep minutes of every meeting of the SRC and such minutes shall be confirmed at a subsequent meeting.

(14) For the purpose of this section "registered student" means a student who is following a course of study in the University for a degree or a diploma, not being a post-graduate diploma, and includes a student who is a holder of a diploma and is following a course of study for a degree:

Provided that a student shall cease to be a registered student within the meaning of this subsection—

(a) upon the publication of the results of the final examination for such course of study, if he passes such examination; or

(b) upon the publication of the results of any examination for such course of study, if he fails such examination, until he is, thereafter, registered again for that or another course of study applicable to a registered student under this subsection.

Establishment of other student bodies.

49.(1) Notwithstanding section 48, it shall be lawful for not less than ten students of the University with the prior approval of the Council and subject to such terms and conditions as the Council may specify, to establish a student body consisting of students of the University for the promotion of a specific object or interest within the University.

(2) The provisions of subsections (3), (4), (5), (6), (7), (8), (11), (12) and (13) of section 48 shall apply *mutatis mutandis* to a student body established under this section as they apply to the SRC.

Acts ultra vires the Constitution of the Persatuan or SRC or a student body.

50.(1) If the Persatuan or the SRC or a student body established under section 49 conducts itself in a manner which in the opinion of the Council is detrimental or prejudicial to the well-being or reputation of the University or acts in contravention of the Constitution of the University or its own Constitution, or any Statute, Act or Regulation of the University, the Council may suspend or dissolve the Persatuan or the SRC or the said student body, as the case may be; and without prejudice to any liability that may arise under any other written law in force, every office bearer of the SRC or the said student body, as the case may be, shall be liable to dismissal from the University or to any other disciplinary punishment that may be inflicted upon him.

Act 30.

(2) The provisions of subsection (1) shall be in addition to and not in derogation from the provisions of section 16 of the Universities and University Colleges Act 1971.

Powers of delegation.

51.(1) Where the provisions of this Constitution or any Statute, Act or Regulation any officer or authority is empowered to exercise any power or perform any duty, such officer or authority may by instrument in writing subject to the provisions of this section and to such conditions and restrictions as may be prescribed in such instrument, delegate the exercise of such powers or the performance of such duties to any authority or to any committee or to any person described therein by name or office.

(2) A delegation under this section may be revoked at any time by the officer or authority making such delegation.

(3) No delegation of any power or duty under this section shall affect the exercise of such power or the performance of such duty by the officer or Authority making such delegation.

(4) Nothing in this section shall apply to any power to make or approve Statutes, Act or Regulations.

Deprivation of Degree, etc. on grounds of misconduct.

52. If any member of an Authority, or any graduate of the University, or any person who has received a diploma or other academic distinction from the University, is convicted by a court of law of any heinous offence whether within or without the Federation, or is in the opinion of the Council guilty of scandalous conduct, it shall be lawful for the Chancellor, on the recommendation of not less than two-thirds of all the members of the Council—

(a) to remove him from membership of the Authority; or

(b) to deprive him of any degree, diploma or other academic distinction conferred upon him by the University.

Disputes as to elections determined by the Chancellor.

53. If any question arises whether any person has been duly elected, appointed, nominated or co-opted to membership, or is entitled to be or to remain a member of any Authority or other body in the University, the question shall be referred to the Chancellor, whose decision thereon shall be final.

PART VII

TRANSITIONAL PROVISIONS

Interpretation.

54. For the purpose of this Part the expression "the appointed date" shall be the 1st day of January 1977.

Succession to property, etc.

55.(1) Subject to the provisions of this Constitution and to any direction by the Council, all property and assets which immediately before the appointed date were vested in the University Agriculture Malaysia or in any person on behalf of the University, shall on that date vest in the University.

(2) Any land in the Federation which immediately before the appointed date was vested in the University Agriculture Malaysia, shall on that date vest in the University.

Rights, liabilities and obligations of the University.

56. Subject to the provisions of this Constitution, all rights, liabilities and obligations relating to any matter which immediately before the appointed date was the responsibility of the University Agriculture Malaysia shall on that date devolve upon the University.

Faculties, etc.

57. Subject to the provisions of this Constitution, the Faculty, Institution and Centre of the University Agriculture Malaysia in existence immediately before the appointed date shall respectively be the Faculty, Institution and Centre of the University.

Continuance of agreement of services, etc.

58. Subject to the provisions of this Constitution, all persons who immediately before the appointed date were employed by the University Agriculture Malaysia shall on and after that date be deemed to be employed as such by the University upon the same terms and conditions as were applicable to them immediately before that date.

Appointments, instruments, etc.

59. All appointments, instruments and documents which were in force immediately before the appointed date shall continue to be in force and have effect as if they had been made or granted under this Constitution.

Students' and registered students.

60. All students who immediately before the appointed date were admitted to undergo courses of studies run for or in the name of the University and on that date were still undergoing the course of studies shall on and after that date be deemed to be students under section 47 of this Constitution; the registered students of the University, other than external students, who immediately before the appointed date constituted a body known as the Students Association of the University Agriculture Malaysia shall on and after that date be deemed to be registered students under section 48 of this Constitution.

Made this 30th day of November 1976.
[KP. Sulit 10030/3; PN. (PU^2) 75 Pt. II.]

By Command,

DR MAHATHIR BIN MOHAMED,
Minister of Education

PRINCIPAL OFFICERS

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Pro-Chancellor	:	Yang Amat Berbahagia Tun Datu Haji Mustapha bin Datu Harun, S.M.N., S.P.D.K., S.I.M.P., P.N.B.S., S.P.M.J., S.P.M.P., S.P.C.M., K.C.R.L., K.St.J., O.B.E. Yang Berbahagia Tan Sri Ong Kee Hui, P.M.N., P.N.B.S., P.G.D.K.
Vice-Chancellor	:	*Professor Nayan bin Ariffin,* J.S.M., Dip. Agric. (Malaya), B.S., M.S. (Louisiana State), Ph.D. (Wisconsin).
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