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Animals
Advanced Aspects of Nutrition (AH032)

Credit Value:  15  
Pre-requisites:  Public Health Nutrition

Rationale and Context:
This module provides an understanding of recent advances in human nutrition research.

Students will be required to bring information from other modules as well as their additional reading in order to construct reasonable debate on current contemporary issues relating to human nutrition.

Intended Learning Outcomes:
1. Review recent epidemiological studies which examine the relationships between diet and chronic diseases.
2. Examine the role and influences played by the food industry on food intake.
3. Evaluate new and novel methods of food processing for their influences on the nutritional profile of foods.
4. Appraise current methods of nutrition education and health promotion.

Indicative Content:
- **Epidemiological studies**: genetics and human nutrition; food and nutrition policies; influences on consumer food intake and public health; Third World nutrition.
- **Food industry**: product development, food promotion, food industry and health promotion
- **Food processing**: new and novel techniques, nutritional profile of food.
- **Nutrition education**: health promotion, population target groups, promoting bodies, interpreting health promotion information.
Advanced Veterinary Nursing (A6006)

Credit Value: 15
Pre-requisites: Medical Nursing
Diagnostic Imaging and Disease Diagnosis
Anaesthesia and Surgery

Rationale and Context:
This module considers the application of the more advanced techniques that may be used for imaging and monitoring veterinary patients. It looks at other techniques the listed or registered VN may use within the ethical framework set out by the Guide to Professional Conduct for Veterinary Nurses.

The organisation of structured clinics will be covered, allowing the qualified nurse to advise clients on a range of husbandry, care, and preventative medicine topics.

We will consider a range of behavioural problems that may be seen in companion animals, and the advice that nurses can give to prevent and treat these problems.

Intended Learning Outcomes:
1) Evaluate the use of advanced diagnostic techniques in veterinary practice.
2) Recognise the range of techniques and opportunities for nursing and monitoring the surgical or intensive care patient.
3) Identify the range of techniques available to the listed or registered VN and judge which fall within the ethical guidelines set by the Guide to Professional Conduct for Veterinary Nurses.
4) Demonstrate an ability to organise nurse clinics and puppy parties in order to provide information and guidance to the owner that will encourage good husbandry and practice.
5) Analyse the basic behavioural problems that may be seen in general practice. Apply appropriate knowledge when advising clients. Synthesise behavioural modification plans.

Indicative Content:
- Advanced imaging and diagnostic techniques: Use of MRI, CT, contrast radiography, ultrasound and endoscopy. ECG for monitoring and diagnosis.
- Techniques available to the listed or registered VN: Ethical considerations in choosing Schedule 3 procedures that may be performed. Techniques to include suturing, wound closure and basic surgical technique, recognition of dental disease and permitted dental procedures.
- Clinics: structure and organisation within the practice. A range of clinics: puppy parties, clinics for healthy pets, preventative medicine, obesity clinics, and clinics to support patients in illness.
Advances in Animal Production Science (AH003)

Credit Value: 15
Pre-requisites: Farm Animal Science (Farm Animal Health, Farm Animal Nutrition and Farm Animal Production Science)

Rationale and Context:
The manipulation of animal productivity requires a breadth of knowledge and understanding gained in earlier modules Farm Animal Health, Farm Animal Nutrition and Farm Animal Production Science. The application of this material to advances in technology is under continued development. This module is designed to develop the ability of students to analyse animal systems and developments in technology and their application to sustainable, environmentally and animal welfare conscious production systems. This will require the application of knowledge and intellectual skills gained in the modules identified above and from experience gained within the animal industry.

The learning associated with the module will be achieved primarily through keynote lectures both from college staff and visiting speakers.

Intended Learning Outcomes

1. Evaluate the key aspects of how farm animal nutrition and health interact with reproduction, lactation and growth, including the acquisition of coherent and detailed knowledge which is informed by information at the fore-front of animal science.

2. Critically evaluate arguments, assumptions and data and frame appropriate questions and make judgements and identify a range of solutions to problems related to farm animal reproduction, lactation or growth.

3. Distinguish and appreciate the limits and applicability of animal science research to practical animal production systems. Apply appropriate methods and techniques to particular problems facing farm animal production and critically evaluate the solutions proposed.

Indicative Content

- **Milk Synthesis and Milk Composition**: Manipulation of milk biosynthesis and factors affecting production and quality. Factors influencing milk yield and composition including the effects of improved genetics on the physiological mechanisms and interactions with nutrition and health management.

- **Optimisation of Reproductive Performance** management strategies as they affect ovulation rate, male reproductive performance and postnatal survival, technological advances in the use of artificial insemination and embryo transfer.

- **Biosecurity**: Disease control and prevention and interaction with animal productivity and human health.

- **Meat Science**: Role of nutrition and breeding in the manipula
Advances in Equine Nutrition and Health (AH004)

Credit Value: 15
Pre-requisites: Equine Science

Rationale and Context:
The maintenance of health and appropriate nutrition are both essential in order to optimise the performance and welfare of equines. Equine athletes and competition horses must be maintained in optimum health in order to compete effectively, whilst pet horses and ponies require good health to ensure welfare. Both types require a diet that is appropriate to their nutritional requirements. This module will develop the concepts of equine nutrition and health introduced in Equine Science and will explore how new developments in health and nutrition are being applied to equine animals.

Intended Learning Outcomes:
1. Develop a management programme applicable to a horse's function and level of performance.
2. Formulate and evaluate equine diet against specified levels of performance.
3. Evaluate different management systems in relation to the health and welfare of horses.
4. Apply advances in animal disease and nutritional science to the management of equine animals.

Indicative Content:
- **Equine health**: Indicators of good and poor health, major infectious, non-infectious and metabolic diseases.
- **Equine lameness**: Causes of lameness and methods of diagnosis.
- **Equine behaviour**: Normal and abnormal behaviour. Maintaining an optimum environment.
- **Emerging issues**: Developments in animal disease and nutritional science and their application to equine animals.
Advances in Equine Reproduction (AH010)

Credit Value: 15
Pre-requisites: None

Rationale and Context:
Knowledge of the scientific principles underlying reproduction in equine species is increasingly important in equine stud management in order to allow advantage to be taken of new techniques such as equine artificial insemination and embryo transfer. This module further develops knowledge of further basic equine reproductive physiology and evaluates recent advances in this area.

Intended Learning Outcomes:
1. Critically review the impact of the breeding industry on the infrastructure of the equine industry as a whole.
2. Evaluate current issues affecting equine reproduction.
3. Critically comment on future and potential developments within equine reproduction.

Indicative Content:
- **Anatomy & Physiology**: Mare, stallion.
- **Endocrine control & Manipulation of Reproduction in the mare and stallion**: Oestrous cycle; seasonal variance/photoperiodism, manipulation and exogenous control of the oestrous cycle, fertility, infertility and subfertility.
- **Gametogenesis**: Spermatogenesis; folliculogenesis and oogenesis
- **Pregnancy**: Conception & infertility; maternal recognition of pregnancy; pregnancy diagnosis; twinning; hormones of pregnancy; foetal development.
- **Parturition**: Hormonal control of birth; dystocia; conditions of the newborn foal.
- **Reproductive Diseases**: Bacterial infections; viral infections; prevention and control.
- **Optimise Reproductive Efficiency**: Artificial insemination; embryo transfer; future developments; ethics and welfare.
Advances in Equine Science (AH036)

Credit Value:  15
Pre-requisites: Equine Science or equivalent

Rationale and Context:
Knowledge of the scientific principles that underlie recent advances in areas relating to equine health, nutrition and reproduction is increasingly important in an industry that has advanced considerably over the past decade. This module will build on the concepts learned in Equine Science and allow the student to develop a deeper understanding of issues affecting the equine industry in these three areas. Considerable independent study will permit students to develop the ability to discriminate, evaluate and analyse information from a variety of sources.

Intended Learning Outcomes:
1. Evaluate current issues affecting equine health, nutrition and reproduction.
2. Critically comment on future and potential developments within equine reproduction.
3. Apply advances in animal disease and nutritional science to the management of equine animals.

Indicative Content:
- **Equine health**: Metabolic and nutritional diseases; equine exotic disease; recent advances in lameness.
- **Equine reproduction**: Advances in reproductive technologies and their application to the equine breeding industry.
- **Equine behaviour**: Normal and abnormal behaviour. Factors contributing to the development of stereotypical behaviour.
- **Emerging issues**: Developments in animal disease and nutritional science and their application to equine animals.
Advances in Farm Animal Health and Welfare (AH034)

Credit Value: 15
Pre-requisites: Farm Animal Health or Principles of Animal Welfare

Rationale and Context:
This module will deepen students’ understanding of farm animal welfare and its links to animal health and disease control. It will allow students to develop their intellectual skills by identifying and analysing welfare problems in commercial production systems. The students will then have to apply technical knowledge gained in this and other modules in an attempt to solve these problems. With the increasing public interest in the welfare of farm animals, an understanding of different indicators and how these may show an animal’s welfare status is required by those involved in any aspect of animal production.

Changes in animal health can lead to changes in animal welfare, just as changes in welfare can lead to changes in health. The module will increase students’ understanding of how the health and welfare of farm animals are interlinked.

The increasing public concern for human food safety and the importance of animal health and animal welfare requires graduates to understand efficient diagnostic techniques and disease surveillance and possibilities for the future in this field. Understanding the production of effective animal medicines is also necessary.

The core element will develop the technical skills and knowledge gained in earlier modules (such as Farm Animal Science, Farm Animal Production Science, Principles of Animal Welfare and Farm Animal Health).

Intended Learning Outcomes:
1. Identify potential welfare problems in the housing or management system of a named species;
2. Synthesise appropriate solutions to these problems;
3. Evaluate the appropriateness of specific techniques available for monitoring and investigating livestock diseases;
4. Identify and evaluate future possibilities for the surveillance and diagnosis of farm animal health status;
5. Evaluate the effects of ancillary industries and professional organisations associated with animal health on disease management in livestock industries;
6. Explain how the health of farm animals affects their welfare, and how their welfare affects their health.

Indicative Content:
- **Farm animal welfare**: In commercial production systems, during handling and transport, in markets and at slaughter, role of the stockperson.
- **Welfare indicators**: Behavioural, physiological and health indicators, assessment of welfare, integrating multiple measures.
- **Commercial, Professional and Governmental organisations**: Role in surveillance, prevention and control of animal health and influence on welfare.
- **Applied immunology and microbiology**: Role of DNA technology and molecular biology in diagnostic tests and the production of therapeutics and vaccines.
- **Laboratory techniques**: Associated with monitoring status and therapy for metabolic and infectious diseases.
Animal Improvement and Bioethics (AH002)

Credit Value: 15
Pre-requisites: None

Rationale and Context:
With the rapid developments in animal breeding technologies an understanding of the processes involved and their relevance to modern livestock production is required. This module will provide the student with the opportunity to apply the genetic principles underlying animal breeding to a number of species of animals and systems of livestock production. To undertake this, students will require an understanding of the systems used in livestock production and other roles to which animals are currently put and may be used for in the future in the context of the socio-economic environment in which they operate. In addition, the relationship between animals and humans is explored and consideration is given to the ethical implications of the various roles of animals in society and the manipulation of animals by biotechnological.

Intended Learning Outcomes:
1. Identify the role of animal breeding in the improvement of animal performance within current limitations imposed by society and legislation.
2. Develop animal breeding solutions to given animal production system problems associated with changes in consumer demands and economic of production.
3. Evaluate the role of developing technological advances in livestock improvement.
4. Evaluate the arguments concerning animal rights/human responsibilities.
5. Evaluate ethical theory and apply it to selected issues in biotechnology.
6. Identify applications of biotechnology to animal breeding and management.
7. Evaluate existing animal legislation and regulation in an ethical context.

Indicative Content:
- **The role of animal breeding**: in the improvement of animal productivity; the effect of breeding value and the environment on performance.
- **Identification of breeding aims, objectives and selection criteria**: and the implication of these on short term productivity and to long term sustainability. Use of animals for; ‘low value’ food, and recreation (work) use in production of ‘high value’ pharmaceutical products.
- **Strategies to improvement**: Between breed selection (identification of desirable breeds or strains); Within breed selection (identification of desirable individuals) and crossbreeding as routes for genetic change; Genetic conservation and protection of rare breeds or lines. National and international breeding schemes and plans
- **Factors affecting rates of genetic gain**: the role of Artificial Insemination, sexing of sperm, Embryo Transfer and Manipulation, Marker Assisted Selection in the modification of; selection differential, heritability, generation interval; genome modification and the dangers of inbreeding and loss of diversity.
- **Ethical thinking**: animal rights, teleological and deontological theories; critical thinking and analysis of bioethics issues.
- **Animals in society**: food, recreation, companionship, experimentation.
- **Animals and biotechnology**: effects of techniques on animal welfare, health and genetic homogeneity, implications for human health.
- **Animal protection strategies**: constitutional change, direct action.
Animal Produce Processing (AH018)

Credit Value: 15
Pre-requisites: None

Rationale and Content:

Animals are an important source of food for mankind. The use of animals as food presents a variety of problems and raises various issues concerning animals as a source of nutrition, the control of quality and food safety in primary processing and food product manufacture and, of course, animal welfare. This module aims to provide students with an understanding of the value of animals as food and the methods used to process animals and convert them into food products. Central to the module is consideration of the factors affecting food quality and safety, the methods by which quality and safety are assured and the legal framework within which animal processing and product manufacture takes place.

Intended Learning Outcomes:

1. Assess animals as a source of food.
2. Evaluate the animal welfare, farm/quality assurance and legal issue associated with the utilisation of animals as food.
3. Evaluate red meat, poultry, fish, milk and eggs as food products.
4. Identify the processes involved in the processing and production of red meat, meat products, poultry, fish, milk, milk products, eggs and egg products.
5. Assess the factors affecting nutrition value and quality of red meat, poultry, fish, milk and eggs.

Indicative Content:

- **Animals as a food source**: main food animals; welfare and farm/quality assurance; legislation.
- **Meat as food**: composition, food value, biological value, lean-fat ratios, visual lean concept, methods of quality assessment.
- **Meat quality**: ante- and post-mortem factors affecting quality; slaughtering and processing; post-mortem glycolysis; microbiological quality; functional properties of meat proteins.
- **Meat processing and products**: meat joints and cuts; modified atmosphere packaging; comminuted meats processing, cooking and quality; spices, herbs, proteins and phosphates, etc., as processed meat ingredients; microbiological quality and food poisoning; legal requirements.
- **Poultry as food**: composition, food value, biological value, methods of quality assessment.
- **Poultry processing and products**: ante- and post-mortem factors affecting quality; slaughtering and processing; fresh and frozen birds; processed and pasteurised poultry products; microbiological quality and food poisoning.
- **Milk as food**: composition, food value, biological value, methods of quality assessment.
- **Milk processing and products**: liquid milk processing; cheese and fermented milk products; butter; milk powders; microbiological quality and food poisoning.
- **Egg as food**: structure and composition, food value, biological value; functional properties of egg, gelation, emulsifying capacity, foaming capacity, foam stability, syneresis, methods of quality assessment; microbiological quality and food poisoning.

- **Egg processing and products**: egg quality; breaking out; separation; pasteurization; maintenance of egg quality.

- **Fish as food, fish processing and products**: capture versus culture; salt-water fish, crustaceans and shellfish; handling, filleting and preserving in ice; packaging and distribution; microbiological quality.

- **Traditional and novel meat products**: fermented meats and fish; cured meats and fish; smoked meats and fish; dried meats; irradiated meats; microbiological quality and food poisoning.
Applied Animal Behaviour (A6002)

Credit Value: 15
Pre-requisites: Principles of Animal Behaviour

Rationale and Context:
Building on the Principles of Animal Behaviour module, this module explores how an understanding of animal behaviour can be applied to meeting the needs of human society. This includes a variety of applications, such as therapy to treat behavioural problems in companion animals, providing enrichment to meet the behavioural needs of captive animals, the training of animals to perform specific tasks e.g. search dogs, improving the efficiency of animal handling systems and utilising herbivore foraging behaviour to promote ecosystem biodiversity. There are two broad approaches to achieving these goals: either using our understanding of animal behaviour to ensure our requirements or actions are compatible with natural patterns of animal behaviour, or using various approaches to modify animal behaviour to meet our specific requirements.

Intended Learning Outcomes:
1. Revise the assessment of normal animal behaviour and illustrate how our understanding in this area can be used to facilitate our interactions with animals.
2. Evaluate the role of environmental enrichment in meeting the behavioural needs of animals kept in captivity.
3. Evaluate the extent to and the means by which animal behaviour can be modified.
4. Examine a variety of examples of how our understanding of animal behaviour has been used to achieve specific goals.
5. Critically appraise the ethical implications of modifying animal behaviour to meet the requirements of human society.

Indicative Content:
- **Using knowledge of behaviour to facilitate human-animal interactions:**
  Assessment of normal behaviour. Facilitating human-animal interactions.
- **Environmental enrichment:**
  Types of enrichment that can be used. Role of enrichment in different systems.
- **Behavioural modification:**
- **Practical examples of applying our knowledge of animal behaviour:**
  Behavioural therapy. Training search animals. Environmental enrichment. Animal handling system design (including farm, zoo and lab animals). Herbivore foraging behaviour and biodiversity.
- **Ethical implications of behavioural modification:**
  Positive and negative ethical implications.
Applied Companion Animal Health and Behaviour (AH011)

Credit Value: 15
Pre-requisites: None

Rationale and Context:
An integrated understanding of companion animal health, welfare and behaviour and the ethical implications of keeping pets is essential for the development of companion animal management programmes that ensure optimum welfare.

This module is designed to provide a detailed knowledge of the factors involved in the aetiology and development of common diseases seen in companion animals (cats, dogs, small mammals, birds and reptiles) and develops the skills required to develop disease control and prevention strategies.

The behaviour of companion animal species will be considered, how these behaviours may be suppressed in domestic settings and how this may lead to the development of pathology and inappropriate or abnormal behaviours. The prevention and control of behavioural problems will also be considered.

The philosophical and ethical considerations of keeping companion animal species will be considered.

Aspects of animal physiology, nutrition, health and general husbandry introduced in earlier modules will form an essential background for this module.

Intended Learning Outcomes:
1. Identify the range of diseases and disorders affecting companion animals and evaluate the factors involved in the development, control and prevention of common diseases.
2. Formulate animal health programmes for common companion animal species including a consideration of zoonotic disease.
3. Demonstrate competence in the recognition of “normal” behaviour and, therefore, the ability to identify what is “abnormal” for different companion animal species. Recognise some common behavioural disorders and methods of prevention and control.
4. Demonstrate an understanding of the implications of pathology and the suppression of “natural” behaviour on the welfare of the animal.
5. Understand the importance of behaviour when considering a domestic animal’s health and welfare.

Indicative Content:
- **Common infectious and non-infectious diseases of companion animals**: The causative agents, pathology, clinical signs, initial care, control and prevention. Infectious disease including bacterial, viral, fungal disease etc. Non-infectious disease including endocrine, degenerative, neoplastic and traumatic pathology.
- **Animal Health Plans**: The development of preventive animal health programmes such as management and recording protocols, anthelmintic and vaccination policies and day to day hygiene recommendations.
- **Common behavioural/welfare problems**: The development, recognition, prevention and control of the common behavioural problems that affect the companion animal species. How behavioural problems may affect the welfare of the individual.
- **Current legislation**: Law in relation to welfare and environmental management, current recommendations for housing.
Applied Companion Animal Health, Welfare and Behaviour (AH035)

Credit Value: 15
Pre-requisites: Companion Animal Behaviour & Welfare

Rationale and Context:
An integrated understanding of companion animal health, welfare and behaviour and the ethical implications of keeping pets is essential for the development of companion animal management programmes that ensure optimum welfare.

This module is designed to provide a detailed knowledge of the factors involved in the aetiology and development of common diseases seen in companion animals (cats, dogs, small mammals, birds and reptiles) and develops the skills required to develop disease control and prevention strategies.

The behaviour of companion animal species will be considered, how these behaviours may be suppressed in domestic settings and how this may lead to the development of pathology and inappropriate or abnormal behaviours. The prevention and control of behavioural problems will also be considered.

The philosophical and ethical considerations of keeping companion animal species will be considered.

Aspects of animal physiology, nutrition, health and general husbandry introduced in earlier modules will form an essential background for this module.

Intended Learning Outcomes:
1. Identify the range of diseases and disorders affecting companion animals and evaluate the factors involved in the development, control and prevention of common diseases.
2. Formulate animal health programmes for common companion animal species including a consideration of zoonotic disease.
3. Explain the importance of behaviour when considering a domestic animal’s health and welfare and apply recognition of “normal” and “abnormal” behaviour to methods of prevention and control of common behavioural disorders.
4. Demonstrate an understanding of the implications of pathology and the suppression of “natural” behaviour on the welfare of the animal.
5. Evaluate the philosophical and ethical issues related to keeping companion animals.

Indicative Content:
- **Common infectious and non-infectious diseases of companion animals:** The causative agents, pathology, clinical signs, initial care, control and prevention. Infectious disease including bacterial, viral, fungal disease etc. Non-infectious disease including endocrine, degenerative, neoplastic and traumatic pathology.
- **Animal Health Plans:** The development of preventive animal health programmes such as management and recording protocols, anthelmintic and vaccination policies and day to day hygiene recommendations.
- **Philosophy and ethics:** The philosophical and ethical considerations of keeping companion animal species will be considered.
- **Common behavioural/welfare problems:** The development, recognition, prevention and control of the common behavioural problems that affect the companion animal species. How behavioural problems may affect the welfare of the individual.
- **Current legislation:** Law in relation to welfare and environmental management, current recommendations for housing.
Equine Nursing (AH014)

Credit Value: 15
Pre-requisites: Anaesthesia & Surgery (VN4)
Diagnostic Imaging & Disease Diagnosis
Equine Science
Medical Nursing (VN3)

Rationale and Context:
Veterinary nursing is currently concentrated on companion animal species. However new legislation and new qualifications are going to lead to a specialist cohort of Equine Veterinary Nurses. This module does not lead immediately to that qualification but will give background theory and practical experience to those who are thinking of moving their careers in that direction or to those who simply wish to extend their expertise and knowledge.

Intended Learning Outcomes:
1. Apply the principles of veterinary nursing and care to the equine.
2. Appreciate the special needs and challenges of the equine surgical patient.
3. Produce preventative medicine plans, or disease control plans for a variety of disease challenges.

Indicative Content:
- **Preventative medicine**: structure, background knowledge and individualisation of plans for an equine holding or an individual animal with a disease challenge. Includes endoparasite and ectoparasite control, laminitis, COPD, vaccination etc
- **Anaesthesia in the equine**: methods and problems. Fluid therapy
- **Equine Nursing**: care of the equine patient during surgery and recuperation. Safety in the handling of equines. Nursing the neonate.
- **Specialist imaging techniques in the equine**: radiography, ultrasonography, scintigraphy, endoscopy etc.
Farm Animal Nursing (AH013)

Credit Value: 15
Pre-requisites: Medical Nursing
Diagnostic Imaging and Disease Diagnoses,
Anaesthesia & Surgery
Farm Animal Health

Rationale and Context:
Veterinary nursing is currently concentrated on companion animal species. However new legislation may lead to an extension of the role of non-veterinary practitioners in the care of farm animals in a range of ways. The veterinary nurse, with training in farm animal health and care and in the epidemiology of infectious and zoonotic disease, is in a prime position to help expand this role in farm animal medicine.

There is a growing opportunity in preventative medicine. The application of knowledge of potential pathogens, management control methods and pharmaceutical products, particularly products currently PML, can lead to effective disease prevention.

Although in times of low farm income elective farm animal surgery is less common, managing the farm animal patient in a hospital or farm situation brings its challenges and rewards.

Intended Learning Outcomes:
1. Apply the principles of veterinary nursing and care to the farm animal species
2. Assess the special needs and challenges of the large animal surgical patient and create potential solutions to a range of care challenges.
3. Evaluate the various testing strategies for exotic and endemic diseases.
4. Create preventative medicine programmes for the herd, flock or individual.

Indicative Content:
- **Surgical Nursing:** pain relief and anaesthetic methods, restraint for surgery, common surgical procedures, imaging etc
- **Nursing care for farm animal species:** neonatal nursing, fluid therapy in livestock species, management of recumbent animals.
- **Prevention programmes:** parasitic disease prevention, vaccination programmes, the effective use of PML pharmaceutical products, prevention and control of production diseases, biosecurity.
- **Testing and eradication/control of exotic and endemic disease and zoonoses:** techniques, epidemiology, official schemes.
Food Policy, Law and Ethics (AH007)

Credit Value:  15
Pre-requisites: None

Rationale and Context:
The food industry is able to influence both people and the natural environment in ways that are good and bad. Laws are established to moderate the conduct of food businesses for the common good and it might be hoped that all businesses would recognise moral duties and obligations to act ethically in ways that transcend the confines of legislation. Yet, in the modern consumer society, we see many instances where the influence of the food industry - or sectors of the industry - is manifested in ways that are not to the good of consumers and the general good of society. Obvious examples concern obesity and food related disease.

This module shall serve to bring an understanding of the relationships between the food industry, society broadly and consumers specifically within the contexts of food law, national food policy and the developing fields of food and business ethics. The module shall provide students with an understanding of the features and dynamics of food policy, as well as the ability to apply ethical theory to issues concerning the food industry and society. It shall also provide an understanding of the mechanisms by which UK and European laws are framed.

Intended Learning Outcomes:

1. Evaluate the concept of ‘food policy’ and examine and rationalise the different facets of food policy in relation to the activities of the food industry and the needs of society.
2. Assess the role of a defined and documented national food policy as a cornerstone of the social structures that provide citizens with health and well-being.
3. Apply principles of food policy to the definition of a national food policy serving the nutrition and health needs of citizens and linking with the business objectives of agriculture and the food industry.
4. Comprehend the foundations of ethical theory with particular emphasis on teleological and deontological concepts.
5. Apply ethical theory to contemporary ethical issues in the context of the food industry and its relationship with consumers.
6. Evaluate the legislative frameworks and processes of the UK and EU and identify the key laws existing for the benefit of consumers in relation to the activities of the food industry.

Indicative Content:

- **Elements of food policy**: food entitlements; food security; food and health (good nutrition and food safety); food labelling; food additives; sustainable methods of food production; environmentally sensitive methods of food production; food subsidies; new food products and processes; food biotechnology.

- **Food and health**: the balanced diet; food pyramids; obesity; diet related disease; role of some food businesses in the promotion of unhealthy diets and the socialisation of poor dietary practice.

- **Food poverty**: social and business causes; effects on the national economy; effects on the health and well-being of consumers.

- **Food security**: factors affecting national food security; influence of supermarkets; globalisation; disease; political disturbance and terrorism.
• **Sustainable food production**: environmentally sensitive methods of food production; regional and local supply systems; influence of production subsidies.

• **Novel food products and food production processes**: selective breeding for improvement; genetic engineering; transgenic food crops; transgenic food animals.

• **Ethical theory**: consequentialism; utilitarianism; theories of duty, rights and justice; ethical principles - beneficence, non-maleficence, autonomy and justice.

• **Practical ethics**: identifying and analysing ethical issues; applying theory and deciding right conduct; the 'ethical matrix'.

• **Ethical issues in food**: food poverty; food supply; marketing and advertising conduct; the instrumentalisation of consumers; food biotechnology; consumer choice.

• **Legislation**: the need for law; the legislative processes of the UK and Europe.
Food Produce Development and Sensory Evaluation (AH016)

Credit Value: 15
Pre-requisites: None

Rationale and Context:
New product development is an activity fundamental to the organic growth and security of food businesses and is constantly reflected in the ever-changing product lines of food retailers. It is a strategic activity that requires planning and organisation if it is to be successful - as evidenced by the translation of ideas into products desired by consumers - and to turn a new product concept into reality requires the integration of many business activities. This module introduces the principles and practices of new food product development and examines the stages of NPD from concept through design and development, to factory scale up and market launch.

Intended Learning Outcomes:
1. Evaluate the role of new food product development in food businesses and the function of sensory evaluation in the NPD process.
2. Understand the relationships between NPD technologists, marketing and production and know how to manage them.
3. Critically evaluate the NPD process and explain how the process should be planned, organised and controlled.
4. Evaluate the product related factors involved in the translation of a product concept into fully defined and marketable food product intended for either the retail or industrial food marketplaces.
5. Appraise the principles and practise of sensory evaluation and apply sensory evaluation methodology.

Indicative Content:
- **NPD stimulus and rationale**: consumer demand; competition; organic growth; NPD statistics; defining and classifying food products; utility and food products.
- **NPD process**: concept identification and development; project brief; design and development specifications; feasibility study; recipe/formulation development; pilot-plant trials; test marketing; production trials; factory manufacture and product launch.
- **NPD interfaces and NPD management**: project planning and management; relationships between NPD, marketing and production.
- **Product considerations**: formulation; nutritional factors; consumer constraints; specification; costing; ingredients and additives; packaging; shelf-life, storage and distribution.
- **Packaging**: function; formats; materials; labelling; QUID.
- **Sensory evaluation**: principles of organoleptic testing; sensory evaluation practice and methodologies; role of sensory evaluation in NPD; consumer evaluation and test marketing.
Food Quality Management (AH006)

Credit Value: 15
Pre-requisites: Farm Assurance and Quality

Rationale and Context:
In the production and processing of foodstuffs, food quality and safety are integrated concepts which apply throughout the whole food chain. The effective management of food quality and safety are intrinsic to the success and security of food businesses. This module provides an understanding of quality assurance and quality management principles and practices as applied throughout the food processing, manufacturing and retailing industries. The aim module is to provide students with key insights to the subject of quality management and knowledge that can be applied directly in the workplace. Specific attention is given to the theory and practice of quality assurance, quality management, food safety management, the use of quantitative methods, international quality system standards and the role of total quality philosophy.

Intended Learning Outcomes:
1. Examine the meaning of ‘quality’, the concept of quality costs and the role of quality management and quality assurance in the operation of food businesses.
2. Evaluate and apply the ISO 9001: 2000 quality system standards to the manufacture of food products.
3. Evaluate HACCP as a systematic method of food safety management.
4. Apply statistical process control techniques to food production operations within the context of average quantity legislation.
5. Analyse the main TQM philosophies and evaluate the TQM tools.

Indicative Content:
- **Definition of quality**: quality control, quality assurance, quality management; food quality and food safety.
- **Farm assurance**: definition; farm assurance schemes; assessment and maintenance of farm assurance schemes; traceability and product recall; significance to food industry and consumers.
- **Quality costs**: failure, appraisal and prevention costs; quality cost management techniques.
- **Documented quality systems**: quality system standards; purpose and application of ISO 9001: 2000; implementation and maintenance.
- **Quality audit**: internal audits; external audits; extrinsic audits; audit management.
- **ISO 9001 certification**: third party certification; certification bodies; UKAS; registration and surveillance process.
- **Alternative quality standards**: BRC and EFSIS standards.
- **Process control**: customer requirements and product specifications; parameters, targets and tolerances; statistical process control by Shewhart charts; process capability.
- **Average quantity system**: Weights and Measures Act 1985; average quantity methodology; code of practical guidance for packers and importers; trading standards and enforcement agencies.
- **Other SPC methods**: cause and effect analysis; Pareto analysis; quality circles; Six-sigma concept.
- **Food safety management**: HACCP system development and implementation.
- **TQM**: concept and philosophy; TQM gurus; employee participation; corrective action, quality circles and continuous quality improvement; TQM process.
Integrated Health Management (AH019)

Credit Value: 15  
Pre-requisites: None

Rationale and Context:  
The purpose of this module is to develop the ability of students to assess the management status of contrasting animal management systems. This information can then be used to formulate appropriate programmes for the maintenance of the health and welfare of the animals and also of the health and safety of staff members and the public. This will require the application of knowledge and intellectual skills gained from Parts 1 and 2 of the course and from experience within the animal industry.

Intended Learning Outcomes:

1. Critically evaluate the health status of animals and the impact of environment, nutrition and management on an animals behaviour and well-being.
2. Evaluate biosecurity on animal units and formulate plans to minimise risk to the health status of a unit while maintaining its function.
3. Formulate management programmes appropriate to the physiological and environmental needs of animals and the safety of staff members and the public who may come into contact with the animals or their products.

Indicative Content:

- **Zoonoses**: diseases of farm animals destined for the food chain, methods of transmission and control. Zoonotic diseases and risks associated with companion animals, exotics and equines.
- **Chemical hazards associated with animal products**: veterinary medicines, pesticides, herbicides, environmental poisons, e.g. naturally occurring heavy metals.
- **Food poisoning and food borne disease**: farm origins, vectors and methods of control.
- **Biosecurity**: Disease control and management on animal units regardless of species.
- **Case Studies**: These required knowledge for completion of these case studies will be based on modules studied earlier in the course. Review of all earlier module indicative content is required. The new skills of application of this understanding to real situations and the formulation of plans or solutions based on analysis of these situations is practiced here.

Students will be issued with case study documents which will vary from year to year and which, in part, will reflect issues of topical interest to the industry.

**Example 1:**
- Assess the health status of an intensively managed pig unit.

**Objectives:**
- Appraise the physical performance of the herd;
- Evaluate the effect of housing, feeding and hygiene on the health status of the herd;
- Devise a health strategy for the unit.
**Example 2:**
- Assess reproductive performance.
**Objectives:**
- Appraise the reproductive performance of a group of animals (dairy herd/horse stud);
- Investigate the factors which impinge on reproductive performance;
- Formulate a proposal for the enhancement of reproductive performance.

**Example 3:**
- Assess the human health hazards posed by animal units.
**Objectives:**
- Demonstrate an understanding of the potential hazards and risks to man of zoonotic diseases.
- Evaluate strategies for the elimination of hazards and reduction of risks associated with animals and animal products.
- Assess the role of current legislation, codes of practice and quality systems in protecting public health.

**Example 4:**
- Assess the effects of environment and management on animal behaviour and well-being.
**Objectives:**
- Evaluate the effects of environment and management on the behaviour and well-being of a variety of animal species.
- Formulate a plan to encourage more natural behaviour and enhance the welfare of animals in a variety of animal management systems.
- Evaluate the potential for environmental enrichment to counteract the negative effects of variety of animal management systems.
Integrated Health Management (AH005)

Credit Value:   30
Pre-requisites: None

Rationale and Context:
The purpose of this module is to develop the ability of students to assess the management status of contrasting animal management systems. This information can then be used to formulate appropriate programmes for the maintenance of the health and welfare of the animals and also of the health and safety of staff members and the public. This will require the application of knowledge and intellectual skills gained from Parts 1 and 2 of the course and from experience within the animal industry.

Intended Learning Outcomes:
1. Critically evaluate the health status of animals and the impact of environment, nutrition and management on an animals behaviour and well-being.
2. Evaluate biosecurity on animal units and formulate plans to minimise risk to the health status of a unit while maintaining its function.
3. Formulate management programmes appropriate to the physiological and environmental needs of animals and the safety of staff members and the public who may come into contact with the animals or their products.

Indicative Content:
- **Zoonoses**: diseases of farm animals destined for the food chain, methods of transmission and control. Zoonotic diseases and risks associated with companion animals, exotics and equines.
- **Chemical hazards associated with animal products**: veterinary medicines, pesticides, herbicides, environmental poisons, e.g. naturally occurring heavy metals.
- **Food poisoning and food borne disease**: farm origins, vectors and methods of control
- **Biosecurity**: Disease control and management on animal units regardless of species.
- **Case Studies**: These required knowledge for completion of these case studies will be based on modules studied earlier in the course. Review of all earlier module indicative content is required. The new skills of application of this understanding to real situations and the formulation of plans or solutions based on analysis of these situations is practiced here

Students will be issued with case study documents which will vary from year to year and which, in part, will reflect issues of topical interest to the industry.

**Example 1:**
- Assess the health status of an intensively managed pig unit.
- Observe the physical performance of the herd;
- Evaluate the effect of housing, feeding and hygiene on the health status of the herd;
- Devise a health strategy for the unit
Example 2:  
Assess reproductive performance.
Objectives:  
- Appraise the reproductive performance of a group of animals (dairy herd/horse stud);
- Investigate the factors which impinge on reproductive performance;
- Formulate a proposal for the enhancement of reproductive performance.

Example 3:  
Assess the human health hazards posed by animal units.
Objectives:  
- Demonstrate an understanding of the potential hazards and risks to man of zoonotic diseases.
- Evaluate strategies for the elimination of hazards and reduction of risks associated with animals and animal products.
- Assess the role of current legislation, codes of practice and quality systems in protecting public health.

Example 4:  
Assess the effects of environment and management on animal behaviour and well-being.
Objectives:  
- Evaluate the effects of environment and management on the behaviour and well-being of a variety of animal species
- Formulate a plan to encourage more natural behaviour and enhance the welfare of animals in a variety of animal management systems.
- Evaluate the potential for environmental enrichment to counteract the negative effects of variety of animal management systems.
Sustainable Animal Production Systems (AH015)

Credit Value: 15
Pre-requisites: Farm Animal Science, OR TWO from the following Farm Animal Health, Farm Animal Nutrition & Farm Animal Production Science

Rationale and Context:
This module is designed to develop the ability of students to analyse UK and world animal systems, resolve associated problems and to ensure a sustainable, environmentally and animal welfare conscious production system. This will require the application of knowledge and intellectual skills gained throughout the course, and from experience gained within the animal industry.

The learning associated with the module will be achieved primarily through assignments which will be underpinned by keynote lectures, visits, tutorials and laboratory analyses. Each student will undertake an appraisal of components of 2 distinct production enterprises with a free choice between enterprises. Additionally there will be 1 examination paper.

Intended Learning Outcomes:
Students successfully completing the programme requirements at this level will be have demonstrated:

1. A systematic understanding of the key aspects of sustainable farm animal production systems within a UK, European and world context, including the acquisition of coherent and detailed knowledge which is informed by information at the fore-front of the subject area.

2. An ability to accurately deploy techniques of analysis and enquiry in relation to the subject area of farm animal systems.

3. To resolve problems and devise and sustain arguments using ideas and techniques that is appropriate to and at the fore-front of the subject area and to provide an appropriate financial analysis of solutions proposed.

4. To describe and comment upon particular aspects of current research in sustainable animal systems and to discern and appreciate the relative merits of different sources of information.

5. Distinguish and appreciate the limits and applicability of research to practical animal systems

6. An ability to manage your own learning, and to make use of up to-date information and original materials appropriate to animal systems.

Typically students should have the ability to:

- apply appropriate methods and techniques to particular problems facing the farm animal industries and to carry out suitable projects and economic analysis.

- critically evaluate arguments, assumptions and data and to frame appropriate questions and to make judgements and identify a range of solutions to a problem, or range of problems facing an animal enterprise.

- communicate and present information, ideas and solutions to both specialist and non-specialist audiences.

- have qualities and transferable skills for employment requiring: the exercise of initiative and personal responsibility, decision-making in complex and unpredictable contexts, the learning ability needed to undertake appropriate further training of a professional or equivalent nature.
Indicative Content:
The briefing documentation will vary from year to year and will reflect issue of current significance to the animal production industry. An example relating to a dairy cow enterprise would be:

- critically analyse the physical and financial performance of a dairy unit that has been detailed and visited.
- propose and justify suitable changes to the current management of the unit, paying particular attention to future changes in support structure and environmental or rural legislation.
- prepare a cost/benefit analysis to the farming system of the introduction of an alternative forage, including the evaluation of the current rations and formulation of new diets.
- evaluate the introduction of a new forage on the grassland management programme and devise a new grassland rotation, paying particular attention to the effects on environmental pollution and how these can be minimised.
- evaluate the requirement to the business of a suitable item of capital expenditure and/or expansion of the business, and prepare and evaluate the cost/benefit analysis of such a capital expenditure.
- communicate the results in a written and oral format to a technical audience.
Sustainable Animal Production Systems (AH030)

Credit Value: 30
Pre-requisites: Medical Nursing
                Diagnostic Imaging and Disease Diagnosis
                Anaesthesia and Surgery

Rationale and Context:
This module is designed to develop the ability of students to analyse UK and world animal systems, resolve associated problems and to ensure a sustainable, environmentally and animal welfare conscious production system. This will require the application of knowledge and intellectual skills gained throughout the course, and from experience gained within the animal industry.

The learning associated with the module will be achieved primarily through assignments which will be underpinned by keynote lectures, visits, tutorials and laboratory analyses. Each student will undertake an appraisal of components of 4 distinct production enterprises with a free choice between enterprises. Additionally there will be 2 examination papers.

Intended Learning Outcomes:
Students successfully completing the programme requirements at this level will have demonstrated:

1. A systematic understanding of the key aspects of sustainable farm animal production systems within a UK, European and world context, including the acquisition of coherent and detailed knowledge which is informed by information at the fore-front of the subject area.
2. An ability to accurately deploy techniques of analysis and enquiry in relation to the subject area of farm animal systems.
3. To resolve problems and devise and sustain arguments using ideas and techniques that are appropriate to and at the fore-front of the subject area and to provide an appropriate financial analysis of solutions proposed.
4. To describe and comment upon particular aspects of current research in sustainable animal systems and to discern and appreciate the relative merits of different sources of information.
5. Distinguish and appreciate the limits and applicability of research to practical animal systems
6. An ability to manage your own learning, and to make use of up to date information and original materials appropriate to animal systems.

Typically students should have the ability to:

- apply appropriate methods and techniques to particular problems facing the farm animal industries and to carry out suitable projects and economic analysis.
- critically evaluate arguments, assumptions and data and to frame appropriate questions and to make judgements and identify a range of solutions to a problem, or range of problems facing an animal enterprise.
- communicate and present information, ideas and solutions to both specialist and non-specialist audiences.
- have qualities and transferable skills for employment requiring: the exercise of initiative and personal responsibility, decision-making in complex and unpredictable contexts, the learning ability needed to undertake appropriate further training of a professional or equivalent nature.
Indicative Content:
The briefing documentation will vary from year to year and will reflect issue of current significance to the animal production industry. An example relating to a dairy cow enterprise would be:

- critically analyse the physical and financial performance of a dairy unit that has been detailed and visited.
- propose and justify suitable changes to the current management of the unit, paying particular attention to future changes in support structure and environmental or rural legislation.
- prepare a cost/benefit analysis to the farming system of the introduction of an alternative forage, including the evaluation of the current rations and formulation of new diets.
- evaluate the introduction of a new forage on the grassland management programme and devise a new grassland rotation, paying particular attention to the effects on environmental pollution and how these can be minimised.
- evaluate the requirement to the business of a suitable item of capital expenditure and/or expansion of the business, and prepare and evaluate the cost/benefit analysis of such a capital expenditure.
- communicate the results in a written and oral format to a technical audience.
Sustainable Food (AH0336)

Credit Value: 15
Pre-requisites: None

Rationale and Context:
At present, there is no legal definition of ‘sustainable food,’ although some aspects eg designations of ‘organic’ or ‘Fairtrade’, are clearly defined. A working definition might be that sustainable food should be produced, processed and traded in ways that:

- Enable viable livelihoods to be made from producing foods
- Avoid damage to natural resources and the environment
- Produce safe, wholesome food now and in the future
- Fulfil society’s right to access ethically acceptable food at a fair price
- Sustain the resources available for producing food - whilst meeting other public needs

Intended Learning Outcomes:
1. Understanding and appreciation of concepts in sustainable food from ethical, environmental, industry and public viewpoints
2. Knowledge of the impact of modern food production systems on the environment in terms of resource consumption and waste disposal.
3. Critical skills in evaluating the systems used (eg organic) and strategies advocated (eg fairtrade) for sustainable food
4. Evaluation of information from monitoring indicators (such as those used by SFFS + FISS) to make valued judgements on progress in developing sustainable food
5. Success in planning objective independent research and learning in a multifactor and rapidly developing subject area
6. Communication skills which can present information, balanced discussion and conclusions from a complex subject.

Indicative Content:
Principles of sustainable food;
   (i) Environmental – resource utilisation (eg water), energy efficiency, agrochemical use, waste management, food transportation, harvesting from the ‘wild’ (eg fish) and maintaining biodiversity
   (ii) Social - fair trade, social audits, ethical considerations (eg animal welfare)
   (iii) Economic- agricultural support (eg CAP), environmental initiatives (eg WRAP)
   (iv) Public health – food safety and nutrition

Policy for development of sustainable food;
   (i) DEFRA Sustainable Food and Farming Strategy – look forward 2006
   (ii) Food Industry Sustainability Strategy 2006

Sustainable food systems;
   (i) organic farming
   (ii) sustainable fishing + fisheries
   (iii) fairtrade food
   (iv) local food
Business Management and Marketing
Business Enterprise (BH011)

Credit Value: 15
Pre-requisites: None

Rationale and Context:
This module allows students with varying amounts of work experience to reflect on the practical establishment and administration of a new business. It is intended to provide the essential analytical and administrative tools and skills required to develop a Business Plan and establish new and successful enterprises. It links with the Introduction to Business and Principles of Management modules, which will provide supporting tutorials on various aspects of business management and on administration. The module is also linked to the Bizcom entrepreneurial competition organised by the Mercia Institute of Enterprise (MIE) with feasible projects being considered for free entry and the chance to win £10,000 in cash and support.

Intended Learning Outcomes:
1. Assess risk and opportunity.
2. Evaluate a given business and apply appropriate organisational methods and structures to facilitate effective management.
3. Design, implement and maintain production and marketing processes together with appropriate administrative and financial systems of control and reporting.
4. Appreciate the critical role of network building and its maintenance.
5. Evaluate a business in terms of its resources and external environment to develop a feasible and practical Business Plan.

Indicative Content:
- **Phases of business development:** Negotiation skills. Seeking seed capital. Tasks and responsibilities allocation. Costing assets, materials, administration and development. Organisation of production and marketing. The need for persistent application to maintain production levels and customer satisfaction. Use of customer feedback to improve products and services. The product and industry life-cycles.
- **Financial planning and records:** The P&L, the balance sheet and cashflow forecast. Pricing of materials and finished goods. Costing elements of delivery.
Consumer Behaviour (BH002)

Credit Value: 15
Pre-requisites: Principles of Marketing

Rationale and Context:
An understanding of consumer behaviour is central to the study of marketing. This module is designed to give the student a sound appreciation of cognitive and behavioural theories and their application to marketing. The module adopts an eclectic approach to the subject by applying theories developed in psychology, sociology, and anthropology. The module Principles of Marketing is considered a desirable pre-requisite.

Intended Learning Outcomes:
1. Review the cognitive and behavioural theories of consumer behaviour.
2. Demonstrate the relationship between the concepts of behaviour and attitudes, and their application to consumer behaviour.
3. Identify patterns of purchasing behaviour based on the behavioural models of the Double Jeopardy Effect, the Duplication of Purchase Law and the Dirichlet Theory.
4. Explain the forces underlying major consumer trends.
5. Appraise the main differences between industrial, organisational and consumer buying behaviour.
6. Design and evaluate marketing strategies taking into account the alternative theories of consumer behaviour.

Indicative Content:
- **Environmental influences**: culture, myths and rituals, diffusion of innovation, lifestyles, personal influence, family.
- **Individual differences**: self, self concept, knowledge, attitudes, personality, motivation, values, demographics, group influence, reference groups.
- **Psychological processes**: information processing, cognitive styles, learning and memory, perception and interpretation.
- **Models of buyer behaviour**: simple ‘black box’, higher level decision models, Howard and Sheth model, double jeopardy effect, duplication of purchase law and dirichlet theory.
- **Consumer trends**: demographic changes, lifestyle changes, the changing consumer, the development of the consumerist movement, corporate and social responsibility, ethical marketing, the ‘new consumer’.
- **Strategy formulation**: new product development, innovation dissemination, retail changes, new technology, point of purchase promotion, advertising, market segmentation.
- **Organisational buying**: buying centres, business to business marketing, gatekeepers, consumer and business buyer behaviour compared.
Contemporary Business Issues (BH005)

Credit Value: 15
Pre-requisites: Work experience (Placement Year)

Rationale and Context:
Given the dynamic nature of business and the business environment, it is important to ensure that students are aware of the impact of sociological, ethical, legal, economic, political, environmental, technological and managerial changes upon industry; can assess the extent of the impact and can relate the changes to business and managerial responses. This module is designed to address the consequences of recently announced/implemented change upon a sector of the economy that is of relevance to the student. It will also provide students with the opportunity to develop their awareness and understanding of a broad range of issues, initiatives and concepts particularly in areas of recent/ongoing research activity. Previous Work Experience (Placement Year) is considered a desirable pre-requisite.

Intended Learning Outcomes:
1. Assess the potential impact upon business of changes in the internal/external environment.
2. Evaluate the consequences of likely trends within an industry.
3. Assess the findings of published research in terms of their validity and reliability.
4. Synthesise evidence from a range of research and theoretical concepts to undertake a critical analysis of the commercial environment.

Indicative Content:
Given the contemporary emphasis of the module, it is difficult to provide a definitive guide to the indicative content. Whilst some topics may be addressed frequently, the content will be responsive to the issues faced by commercial organisations. Therefore, this following list is merely illustrative as to the topic areas that may be covered.

- **Political**: The political environment has a significant impact upon people, organisations and the commercial environment. The module will seek to examine the announced/potential policy decisions of both the UK and Europe.

- **Legal**: Legislation introduced by the Government (& Europe) can have a profound effect upon business. By exploring issues such as diversity and equality, students will be provided with an opportunity to review the impact of legislation and reflect upon their own responsibilities and actions.

- **Economic**: The economic activity of the commercial sector also raises issues regarding our natural environment and the sustainability of business. In addition, the nature of business means that it is important to measure and understand the notion of competitiveness and new market opportunities.

- **Technological**: The progress of technology inevitably requires organisations to constantly review their operating practices. By identifying potential future innovations (& their likely implementation), the module will attempt to forecast the medium to long-term implications for the commercial environment.

- **Sociological**: The importance of understanding ‘intangible’ factors can be a critical success factor in business. Analysing the ethics of business practices is an important issue to explore and understand in the modern business environment.

- **Managerial**: The dynamic nature of the commercial environment requires that managers implement policies to address issues such as corporate and social governance, sustainability, environmental auditing and ‘fashionable’ managerial trends.
Entrepreneurial Marketing for Veterinary Practice Managers (BH009)

Credit Value: 15
Pre-requisites: Research Methods
Work Experience (Placement Year)

Rationale and Context:
Marketing is a business philosophy that regards customer satisfaction as the key to a successful service industry and advocates the use of management practices that help identify and respond to customer needs. However, as most organisations now embrace marketing, it is only those that implement it in an original or entrepreneurial manner that achieve competitive advantage. The successful application of entrepreneurial marketing principles is seen as a vital factor contributing to the success of any veterinary practice. This module seeks to develop concepts introduced in the module Veterinary Practice Management and is concerned with the application of entrepreneurial marketing theory and practice within the animal care industry. It focuses on the promotion of entrepreneurial products/services and businesses in relation to the need for a consumer orientated approach to business. The module Research Methods and Work Experience (Placement Year) are considered desirable pre-requisites.

Intended Learning Outcomes:
1. Explain why it is necessary for all employees of a veterinary practice to adopt a customer orientated approach to their work in terms of satisfying customer wants and needs.
2. Analyse the market of a veterinary practice using the concepts of market segmentation, the product lifecycle and portfolio analysis.
3. Assess various options and select the most appropriate course of action in relation to developing an entrepreneurial marketing mix policy with special reference to services marketing.
4. Assess the marketing environment in which a veterinary practice operates and combine the findings with information regarding the marketing resources of the practice to produce an entrepreneurial marketing plan.

Indicative Content:
- **Product and Service policy decisions**: Products and services, brands and branding, the life cycle, delivery.
- **Situations**: Concept of service price, pricing techniques, changing prices, product and service.
- **Entrepreneurial marketing plan**: Entrepreneurial marketing planning techniques, systematic control systems
- **Buyer behaviour**: Personal and group aspects of behaviour.
- **Market segmentation**: Nature and purpose of market segmentation, positioning and targeting of services.
- **The services marketing mix**: The Product/Service mix and new service development; managing services; pricing decisions and their implications; promoting services: advertising, sales promotion, direct-mail, public relations, personal selling and negotiation.
International Agribusiness (BH018)

Credit Value: 15
Pre-requisites: Agricultural marketing

Rationale and Context:
Agribusiness is a diverse industry, which includes business activities from small agricultural producers to large multinational companies. This module sets out to generate an awareness of the dynamic forces and the important aspects of management of companies trading in an international environment. The ability of the key agribusiness players to respond to these changes will depend on their knowledge, managerial expertise, leadership ability and creativity. The management of risk and development of effective marketing and management strategies in an international agribusiness environment, is key to competitive advantage and success.

Intended Learning Outcomes:
1. Appraise the major business environmental factors, which influence the market and management of agribusinesses.
2. Assess the impact of regional trade alliances and markets on the management of agribusinesses operating in an international environment.
3. Explain the role of future markets, and evaluate the impact of speculation in currencies and commodities on agribusinesses.
4. Evaluate the alternative marketing systems and management strategies for risk management adopted by organisations operating in the international agribusiness environment.
5. Apply concepts and theories of international marketing to agribusiness players in international markets.

Indicative Content:
- Major environmental factors: Political, social economic and technological factors; international organisations facilitating changes, consumer behaviour trends.
- Regional trade: WTO, NAFTA, EU and UK policies and legislation; international trade position; economic indicators; retail trading alliances.
- Futures markets, currencies and commodities: Currency and commodity relationships, supply and demand; balance sheet of commodities; management of risk; hedging, options, financing and information flow for brokers, traders and agribusinesses.
- Marketing systems and strategic options: Market demands, market planning, analysis of economic factors; management of risk; partnerships and collaborative ventures; vertical and horizontal integration; globalisation of businesses; Multinational enterprises; cross-cultural business; multinational or regional management approaches.
- International management strategy: Business policies; legal compliance; supply chain constraints; logistics; product development; pricing considerations; value chain; export risk and procedures.
Management Consultancy Project (BH010)

Credit Value: 15
Pre-requisites: Business Finance
Project Management
Managing Business Resources

Rationale and Context:
One of the key skills in business is to be able to work with others on the identification and successful solution of a business problem. Normally this would be done as an employee of an organisation with the problem but sometimes this may involve the use of outside consultants. The use of outside consultants provides a fresh and often innovative perspective on the problem and this module is designed to give students insight into the value of external consultancy. It is also intended to equip students with the practical and analytical skills required of external consultants. Students will work in groups on the solution of a problem, where possible, with a live business.

Intended Learning Outcomes:

1. Critically appraise the role of consultants and the nature of consulting small and medium sized enterprises (SMEs).
2. Evaluate business and management theory and apply it in proposing a solution to a business problem.
3. Analyse a business problem in its operating context using appropriate concepts and techniques.
4. Assess a consultancy, manage and review the brief, the plan to address the problem, adopting agreed roles within a group and resolving issues of responsibility and work output.

Indicative Content:

- **Models and roles of consultancy:** Technical expert, Facilitator, Contractor, Temporary member of staff, Professional partner.
- **The consultancy process:** Entry, contracting, data collection, Diagnosis, Consideration of alternative solutions, Evaluation, Proposing solutions, Gaining commitment, Disengagement, Dealing with client/consultant boundaries and dependencies.
- **Project management:** Initiation, Issue management, Resource planning, Effective reviews, Change Control, Time management.
- **Presenting results and recommendations:** Choice of techniques, Planning for commitment, Dealing with resistance, Change Management and Barriers to change.
Managing People (BH004)

Credit Value: 15
Pre-requisites: Appropriate Work Experience (Placement)

Rationale and Context:
As prospective employees and managers in the business world, it is essential that students have an understanding of the effective management of people. This module is therefore designed to develop an understanding of human motivation and management style, the responsibilities of employer and employee, and an appreciation of how to manage effective interpersonal relationships at work. It is normally delivered post placement to build on professional experience, but may be studied pre-placement, referring to a student’s pre-college or other work experience.

Intended Learning Outcomes:
1. Demonstrate the importance of interpersonal skills in people management.
2. Appraise the prevailing human resource management style and approach in an organisation familiar to the student.
3. Carry out effective appraisal of colleagues and self-appraisal in relation to career development.
4. Review experience gained at work and relate this experience to theories of management and workplace psychology.
5. Identify and organise personal strengths and weaknesses in managing oneself and other people.
6. Evaluate models and activities that would improve the effectiveness of staff at work in specified organisations.

Indicative Content:
- **Workplace psychology:** Motivation at work. Dealing with difficult people. Assertive behaviour vs aggressive and passive behaviour. Transactional analysis and its application to dealing with staff, managers and customers.
- **Core interpersonal skills:** Listening and constructive feedback skills. Questioning skills and their application to managing staff and customers.
- **Groups and teams:** Behaviours in groups. Building effective teams. Team role theories and their practical application.
- **Leadership and management:** Appropriate choice of management styles. Situational leadership theories and their application.
- **Learning and development:** Structured approaches to staff development and training. Appraisal and performance feedback systems.
Networking and Collaboration (BH019)

Credit Value: 15
Pre-requisites: None

Rationale and Context:
An increasingly networked, global and complex economy is enabling and forcing consumers, customers and suppliers to combine, in various forms, to create value and compete. This module focuses on the networking, cooperation, competition, relationship management and social capital characteristics of these traditional and new coalitions. There will be sufficient flexibility within the module to allow students to specialise in their fields of interest, particularly in two areas of collaboration. The first is agri-business and food chain collaboration, where contextualisation will use tools and case studies developed by EFFP and the Food Chain Centre. The second is rural business, where the challenges inherent in developing rural social enterprises will be examined, using case studies drawn from outreach work.

Intended Learning Outcomes:

1. Research and analyse the features, operation and value of different network forms.
2. Critically evaluate the main forms of collaborative or social enterprise and discuss their development in the agri-food or rural sector both in the UK, Europe and globally.
3. Use relational concepts to analyse and evaluate case studies of collaborative or social enterprise.
4. Make justified recommendations to improve the strategic and tactical management of organisational relationships.

Indicative Content:

- **Networks and Networking**: formal, informal and virtual networks (e.g. supply/netchains, professional networks, business clubs, communities-of-practice, virtual social networks); strong and weak ties; hubs and clusters; electronic networking and collaborative working; cooperative work systems, groupware and other social and collaborative software.

- **Co-operative/Collaborative Enterprise** (e.g. for agri-business &/or supply chains): types of collaboration - arms-length, integrated; co-petition, FCBs (co-operatives, buying and marketing groups and machinery rings), partnerships, strategic alliances, joint ventures, outsourcing, off-shoring, inter-agency and project partnerships; ethical issues: unfair competition, cartels, corruption, codes of practice, certification, assurance and other safeguards; collective/collaborative intelligence.

- **Social Enterprise** (e.g. with a focus on rural community projects): social enterprise characteristics; setting up a social enterprise; government roles in rural social enterprise development; support mechanisms for social enterprises; legal and regulatory issues; finance and funding; social audit and quality standards; performance management and benchmarking; success and failure of social enterprises.

- **Relational Concepts** (in interpersonal, intra/inter-organisational or horizontal/vertical relationships): hierarchy, power, conflict, dependency, equality, governance, contracts, transaction cost, game theory, commitment, trust and distrust, transparency, core competence, strategic alignment, communication, information hoarding and sharing, learning and knowledge transfer; social capital and relationship capital (e.g. guanxi in China and blat in Russia) - measurement issues.
• **Relationship Management** (in interpersonal, intra/inter-organisational or horizontal/vertical relationships: Relationship Marketing (e.g. internal, market, stakeholder and inter-organisational relationships); relationship life cycle, selection/assessment of partners/customers/suppliers/agencies, service level agreements, relationship portfolio management, risk assessment, relationship building, KPIs and benchmarking relationships, exit strategies.
New Product Development (BH017)

Credit Value: 15
Pre-requisites: Principles of Marketing

Rationale and Context:
The concept of New Product Development is recognised as being vital to the economic success of companies and nations alike. Put simply, New Product Development is the process by which companies survive in the long term, as they strive to constantly identify innovations to meet current and future demands of consumers. Innovation may refer to successful developments, to products and services or to the process of manufacturing and delivery. Innovation and new product development have become the key strategic focus for successful companies.

Companies are also placing increased emphasis upon issues relating to economic and environmental sustainability, which represent major factors influencing the success of an organisation. Furthermore, consumers are taking an increasing interest in the ethical practices of companies, a trend that companies can no longer afford to neglect. Ultimately, managers need to accept the challenges to their competitive positions or face lower growth and profitability.

Intended Learning Outcomes:
1. Identify the reasons for success and failure in New Product Development.
2. Assess methods of organising for new product development
3. Evaluate the usefulness of new product development models.
4. Review the process of new product development for both products and services.

Indicative Content:

- **Organisational issues**: Project planning and timing. Project management. Team structures and team development. Controlling projects.
- **Models**: Practice, short comings and improvements. Diffusion of innovation.
Retail Buying (BH007)

Credit Value: 15
Pre-requisites: Food Marketing
              Retail Operations

Rationale and Context:
The buying function is a pivotal role in food retailing, with buyers acting as the lynchpin between suppliers and a retailer’s own organisation. However, with the introduction of new management practices, such as Category Management and Customer Relationships Management, the traditional view of buying has broadened and developed to incorporate wider functions and roles and to involve greater team-based interactions, both internally and externally to the retail organisation. Buying is conducted on an increasingly global stage and import and export management knowledge is essential to its understanding and operation. In an international buying context it is important to also comprehend financial aspects relating to trade. The modules Food Marketing and Retail Operations are desirable pre-requisites.

Learning Outcomes:
1. Identify the key functions and operations of buying in a global food industry context and comprehend the role and organisation of the buyer.
2. Evaluate the developing concepts of Category Management, Customer Relationships Management and team based buying and application of these concepts to retail buying.
3. Appraise current retail market and food sector trends; and determine how these may affect retail buying in the future.
4. Assess ways in which changes in information technology have and will further influence retail buying from the viewpoint of both business-to-business buying and that of end consumers.
5. Appraise the regulations and mechanisms covering import and export activities as well as understand how exchange rates affect cash flows.
6. Demonstrate awareness of where to borrow and invest; and what types of mechanisms can be used to raise capital to finance foreign trade.
7. Critically appraise the role of international trade in a business organisation and evaluate the risks associated with international trade.

Indicative Content:
- Comparisons of industrial and consumer buying processes and buying models. The changing role of the buyer from individual to team-based buying.
- Retail buying: differences and similarities to other industrial sector buying. The principal retail buying sectors.
- The role of the retail buyer: determining order quantities, product specifications, pricing of materials and costing elements of production. Product and supplier selection, decision types in information sources, selection criteria, legislative compliance, the decision making process and negotiation of terms.
- Practices of modern buyer management: An introduction to Category Management, an introduction to business-to-business and Customer Relationships Management, multiple and singular buying interfaces; facilitation in conjunction with retailing commercial, technical/ quality and logistical roles.
- The impact that IT and online direct/ collective purchasing has had: on the traditional buying practices and processes and what impact ICT will have on the future of buying.
The markets for foreign exchange: an introduction to exchange rates; forward exchange; currency futures and option markets.

Determination of exchange rates: including the balance-of-payments accounts; supply and demand view of exchange rates; modern theories of exchange rates; alternative system of exchange rates and the international financial system.

Institutional structure: multinational banking; instruments and institutions of international finance and trade.

Context for international trade: reasons, problems, broader international opportunities and trading patterns.

Import and export practice: organisations for export and import; policy considerations; documentation and procedures; constraints; modes of shipment; customs and excise; international conventions; insurance.
Strategic Management (BH003)

Credit Value: 15
Pre-requisites: None

Rationale and Context:

A thorough appreciation of the concepts and techniques of Strategic Management is needed by all senior managers in order that they might manage their organisations both efficiently and effectively. This module focuses on the role of company-level strategy and its relationship with the other main business functions. Through extensive use of case study material, it allows students to reflect on practical experience gained during the placement period. By integrating theory and practice from a number of subject areas, students will be able to appreciate the contribution of the various functions within an organisation to the development of an overall strategic direction. The importance of effective implementation is emphasized along with the need for flexible strategies and the proactive management of change. The modules Business Finance or Equivalent Module, Principles of Marketing, Business Organisation and Work Experience (Placement Year) are considered desirable pre-requisites.

Intended Learning Outcomes:

1. Communicate clearly, concisely and confidently, using an appropriate format.
2. Collect, select and critically evaluate information from a range of sources.
3. Manipulate and interpret complex sets of data, assess their reliability and present them in an appropriate format.
4. Demonstrate familiarity with, and understanding of, the important facts and principles in a broad field of study and an awareness of the provisional nature of knowledge and theory.
5. Undertake strategic analysis of an enterprise integrating operations, finance, marketing and people functions.
6. Discuss the impact of less tangible factors including organisational culture, business ethics and leadership on strategic decision making.
7. Apply strategic management principles to the specific practical requirements of small and medium sized enterprises (SMEs), public and voluntary organisations.
8. Develop a change management plan to support an agreed business strategy.

Indicative Content:

- **Introduction to strategy**: organisational structure and operation; strategic business units; strategy and tactics.
- **Corporate mission and strategic objectives**: competitive advantage.
- **Strategic analysis**: external appraisal - ETOP, PEST, SWOT; internal appraisal - marketing audits; portfolio analysis - Boston box, GE Shell matrix. Stakeholder analysis. Strategies to adopt with a range of stakeholder groups. Shareholder value.
- **Business ethics**: Appropriateness of Company Type for current stage of business development.
- **Strategy formulation and choice:** strategic direction - Porter, differentiation and cost-leadership, the experience curve; generic strategies Boston box, market entry, consolidation, withdrawal, alliances, acquisitions. Environmental awareness and sustainability.

- **Strategy implementation:** resource implications - financial, human, etc; human implications - communication of strategy to staff; planning - feedback, management information systems, strategic decision making perspectives - techniques, styles. Group pressures. Political aspects in organisations.

- **Management of change:** The creation of resistance. The psychology of change. Force-field analysis. Leading change - roles to be adopted in different business situations. Creating a change management plan.
Supply Chain Management (BH001)

Credit Value: 15
Pre-requisites: None

Rationale and Context:
The supply chain constitutes a critical link between primary producers, processing and manufacturing businesses, retailers and the consumers. It is a link that must be structured, organised and managed successfully if businesses are to compete in a dynamic marketplace. Indeed, design and operation of supply chains are often decisive factors in the ability of businesses to achieve competitive advantage. This module examines the concept of the modern global supply chain and explores the many factors required to create, operate and control supply chains efficiently, effectively and sustainably.

Intended Learning Outcomes:

1) Analyse the complexity of global supply networks, drawing on supply chain management theories, research literature and best industry practice.
2) Evaluate supply chain strategies for gaining competitive advantage, particularly in an agri-food/retail context.
3) Assess strategies for developing and managing supply chain relationships.
4) Review the role of planning and technology in managing the global movement and storage of goods and associated information.
5) Monitor the performance of supply chains using ethical, environmental, effectiveness, efficiency and risk indicators.

Indicative Content:

- **Global Supply Networks & SCM strategies:** the changing structure of international supply chains, definitions: SCM v logistics & PDM and move to functional integration; the strategic role of Supply Chain Management (SCM); theory and practice; retail centralisation and internationalisation; local v global sourcing; supply and distribution channel strategies; agri-food/retail case studies.
- **Supply chain relationships:** B2B networks, power, trust/distrust, collaboration, efficient consumer response (ECR), Category Management, supplier selection and vendor appraisal, 3 and 4PL.
- **Storage, handling, transport, information & technology:** RFID, packaging, distribution centres, cross-docking, automatic storage and retrieval systems, materials handling; review of freight transport, modal choice, cool chain, reverse logistics; demand forecasting, collaborative planning, electronic data interchange (EDI); web-based information sharing, e.g. Sainsbury’s Information Direct (SID); SC implications of online retailing, hubs and alternative distribution.
- **Performance, optimisation and sustainability:** optimising quality, service and costs; availability, wastage, responsiveness; demand amplification (bullwhip effect); importance of systems thinking and trade-offs; benchmarking and supply chain performance measurement; lean thinking, value chain analysis; green logistics - reducing road/food miles/carbon costs and life cycle assessment; supply chain risk & resilience; ethical sourcing and Fairtrade.
Veterinary Practice Management (BH008)

Credit Value: 30
Pre-requisites: Introduction to Veterinary Nursing and First Aid
Client Care and Management of the Clinical Environment
Diseases Diagnosis and Medical Nursing
Diagnostic, Imaging and Anaesthesia and Surgery
Advanced Vet Nursing

Rationale and Context:
Modern veterinary practice management incorporates many diverse business skills including people management, accounts and salary management, marketing the practice and day-to-day administration. This module introduces students to the business knowledge and skills required in order to successfully manage the busy veterinary practice. It is designed to complement the material covered in the module Entrepreneurial Marketing for Veterinary Practice Managers.

Intended Learning Outcomes:
1. Evaluate the relationship between people and make suggestions to improve the effectiveness of staff.
2. Assess a practice in terms of health and safety and employment law and develop proposals to ensure compliance.
3. Synthesise the principles of operations management and apply these principles to ensure effective and efficient running of the practice.
4. Evaluate the practices marketplace and use marketing concepts and techniques to develop a workable marketing plan.
5. Analyse the financial performance of the practice and make financial decisions based on this analysis.

Indicative Content:
- **Introduction to Veterinary Practice Management**: Structure, buildings, ownership, organisational, operations, staff, the organisational environment.
- **Personnel management**: The role of a practice manager. Recruitment and management of junior nurses, kennel staff, receptionists and cleaning staff in order to maintain an efficient and effective working team environment. Preparation of rotas, continued learning (CPD), staff/practice handbooks.
- **Employment Law**: Employment contracts, probationary periods, redundancy etc. Job descriptions, maternity pay, sick pay, PAYE, grievance procedures, staff appraisals, reward systems, leadership.
- **Statutory and ethical requirements**: Ethical requirements of the veterinary practice, RCVS code of conduct. UK import and export procedures. Risk assessment and health and safety. Statutory medicines legislation including COSHH, health and safety, fire regulations, waste disposal etc. Consent forms.
- **Stocking and stock-taking**: The importance of stock control. Management of drug and equipment levels to ensure availability of resources within financial constraints. Drug storage. Suppliers.
- **Office management**: Daysheets, receipts, banking, petty cash, credit control, pet insurance claims, book-keeping, filing, use of computer systems.
Crops
Advanced Agronomy (CH002)

Credit Value: 15
Pre-requisites: Crop Production Systems (C) and EITHER Crop Science (I) OR TWO from the following: Crop Protection and Technology (I) Crop Growth & Management (I) Soil & Plant Nutrition (I)

Rationale and Context:
This module is specifically designed to build on the principles taught in the modules Crop Production Systems and Crop Protection and Technology. The module will demonstrate how an in-depth understanding of agronomy, pest, disease and weeds can assist with the formulation of integrated crop protection plans which utilise the cultural, chemical and biological control methods required in current crop assurance strategies. Similarly, the module will endeavour to develop a greater understanding of crop and soil nutrition in order for students to formulate environmentally sound crop nutrition plans.

Students studying this module should develop agronomy knowledge in line with the pre-requisites required for access to training for professional accreditation, e.g. BASIS and FACTS.

Intended Learning Outcomes:
1. Evaluate the major pest, disease, weeds and nutrient deficiencies found in mainstay UK crops.
2. Synthesise crop protection control strategies relative to target organisms and management strategies appropriate to the farming system employed.
3. Assess soil nutrient supply and develop nutrient balance sheets as appropriate to the crop and site.
4. Recognise and reduce the environmental impact of crop protection and nutrient inputs to the farming system.

Indicative Content:
- **Weeds, pests and diseases:** Identification of organisms threatening mainstay UK crops. Relationship between organism and crop performance (including thresholds). Suitability and impact of control strategies.
- **Technology:** Use and limitations of ‘expert systems’, diagnostic tools and precision equipment.
- **Crop Nutrition:** Interpretation of soil analysis, implementation of ‘best nutrient practice’ in the production of nutrient balance sheets with reference to site and system limitations, e.g. NVZs. Identification of nutrient deficiencies and remedial solutions.
- **Agronomy:** Multi-discipline planning for site and soil factors which influence cropping, crop management, varietal selection and development of ‘smart’ rotations.
- **Environment:** Use of ICM/IFM principles in sustainable management strategies for the benefit and protection of the agricultural environment including efficient energy use in the farm business.
- **Financial:** Awareness of cost effectiveness of inputs in both long and short term plans.
**Alternative Crops (CH003)**

**Credit Value:** 15  
**Pre-requisites:** Crop Production Systems

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**Rationale and Context:**
Alternative crops is a broad subject area covering the production and processing of a wide range of crops. These can be divided into five major themes:

(i) Energy crops for fuel, such as miscanthus and short rotation coppice grown as a source to produce heat and electricity.

(ii) Energy crops for biofuel, such as oilseed rape grown for processing to biodiesel and cereals or sugar beet grown for processing to ethanol.

(iii) Fibre and bio composite crops such as hemp and flax.

(iv) Crops to be processed to pharmaceuticals e.g. evening primrose, borage and oilseed rape.

(v) Other speciality or novel crops such as crambe and woad.

The area of these crops grown is currently small, but will increase considerably for a number of reasons. These include international agreements requiring individual countries to reduce greenhouse gas emissions by 12.5% below 1990 levels by 2012 (Kyoto Protocol) and the need for the UK to generate 10% of electricity from renewable sources by 2010. Ethanol is produced on an industrial scale in North America, and currently the UK is considering legislation that will require 10% of fuel to be produced from renewable sources to comply with the EU Biofuels Directive. Additionally, alternative crops are receiving more attention as farmers search for alternative sources of income to replace that received from the production of food crops.

Students will learn about crop choice, growth, management, harvesting and processing for a particular use through keynote lectures, directed reading and visits. The module will develop the students’ ability to assess the potential markets for alternative crops, examine the feasibility of growing the different crops and integrate these crops into sustainable farming systems. Students will also investigate the implications of introducing alternative crops on the future viability of farming in a local, regional, national and international perspective. This not only takes into account the biological and economic viability, but also the social implications of farming policy on the rural economy and environment.

**Intended Learning Outcomes:**

1. Describe the range of alternative crops available to the North European farmer.
2. Understand the production and processing requirements for individual crops.
3. Understand the national and international legislation underpinning the growth and use of alternative crops.
4. Appraise the outcome of production of selected alternative crops and analyse the financial returns of growing alternative crops compared to that resulting from the production of food crops.
5. Review current and future opportunities for the growth of alternative crops in Europe.
6. Identify areas relating to alternative crops that require further research and indicate how these gaps in the knowledge base might be filled.
Indicative Content:

- **International, EU and UK legislation:** including legislation supporting the growth of biofuel crops; legislation to reduce the emission of greenhouse gases; effects of proposed future legislation on the growth of alternative crops; area payments and EU grants relating to non-food crops.

- **Energy crops for fuel:** market opportunities, production and processing of biomass crops including miscanthus and short rotation coppice.

- **Energy crops for biofuel:** market opportunities, production and processing of crops for the production of biofuels including oilseed rape for biodiesel and cereals or sugar beet for ethanol.

- **Fibre and biocomposite crops:** market opportunities, production and processing of crops for extraction and utilisation of fibre, including hemp and flax.

- **Pharmaceutical crops:** market opportunities and production of crops for the extraction of pharmaceuticals, including evening primrose, borage and oilseed rape; Pharming and biotechnology.

- **Other novel food and non-food crops:** an appraisal novel food crops and speciality crops including crambe and woad.

- **Agronomic, political and social issues involved in producing alternative crops:** how alternative crops can be incorporated into current crop production systems; Effects of the growth of alternative crops on farming and the rural community at local, regional, national and international level; The role of alternative crops in sustainable farming and sustainable social policy.
Crop Improvement (CH004)

Credit Value: 15
Pre-requisites: Crop Production Systems

Rationale and Context:
Plant breeding - either by conventional or modern biotechnological - is essential to the success of modern crop production as seen by the dramatic increases in yield of the last half century of many cereals, along with the improved quality and pest resistance which remain vital to arable production.

Conventional crop breeding programmes are based on fundamental genetic principles and an awareness of these principles is essential for the understanding of how breeding programmes run. Equally, since a specific varieties' performance can only be judged in the field, it is also a very practical and applied subject.

Additionally, the advent of modern biotechnological methods to genetically modify crops is becoming increasingly important to crop improvement. Not only for its potential for weed, disease and insect pest control, but also because of the wider implications that the use of this technology brings. Hence, this module will also examine the methods used to transform plants and appraise their success, as well as examining future developments alongside the issues surrounding their release and commercial use.

The module will build on previous modules, including Crop Production Systems to understand how crops are improved to meet the ever changing demands of agriculture.

Intended Learning Outcomes:
1. Identify the role of breeding in crop production.
2. Evaluate the principles and techniques employed in breeding new varieties.
3. Evaluate conventional breeding techniques including biotechnology.
4. Evaluate potential and limitations of biotechnology to crop improvement.

Indicative Content:
- Understand basic genetic principles underlying breeding methods.
- Assess trends in crop improvement: historical and world context from domestication to modern breeding.
- Understand sources of exploitable variation: wild relatives - genetic erosion and conservation, induced variation - mutations, polyploidy, genetic engineering.
- Outline the logistics of a plant breeding programme including pedigree management.
- Contrast the breeding systems for inbreeding and out breeding crops: examples from cereal crops to demonstrate bulk breeding, pedigree breeding and single seed descent and F1 hybrids.
- Assess the success in breeding for specific traits: including yield, quality and pest resistance.
- Comprehend the Role of NIAB/HGCA: Seed production and the associated legislative framework.
- Apply how the Central Dogma underpins biotechnology.
- Assess biotechnological methods to transform plants: including somaclonal variation, use of vectors, protoplast fusion and shotgun techniques.
- Judge the potential of current and future potential of biotechnologies: including herbicide and insecticide resistance, long-life tomatoes and potential future developments.
Rationale and Context:
Modern farming requires farmers and their advisers to have an understanding of food production in a worldwide context. Decisions at the production level must take into account various factors such as world markets, productive capacity and modern farming technologies. In addition, increasing globalisation invariably has affected the supply, demand and importance of world agricultural products - and UK farmers need to be able to compete in these global markets. Coupled with growing concerns about environmental sustainability (increase in desertification, global warming, use of non-renewable energy sources, limits of the water resource) it is therefore essential to be aware of these changes and the potential and problems that they bring.

This module will build on the knowledge gained at certificate and intermediate level production systems modules and place them in a global context. The climatic, economic and social constraints will be considered as part of a world market.

Intended Learning Outcomes:
1. Evaluate the demand for, and competition in, the agricultural products in the global market.
2. Assess the global potential for food production (and non-food products) and highlight both the key cropping and animal production systems.
3. Understand the key features that determine crop yields and animal production levels and apply them to specific regions of the world. Compare different systems of production around the world.
4. Heighten awareness of why different crops predominate in different regions of the crop.
5. Evaluate the extent that economics, government policy, climate and world events all influence agricultural production.

Indicative Content:
- Outline of worldwide agricultural systems and associated climatic patterns: factors affecting crop productive potential and animal production systems. Contribution of plants, livestock, and fish to human diets in contrasting geographic areas.
- Global importance of sustainable agriculture: increase in desertification, climate change, use of non-renewable energy sources, limits of the water resource.
- Case studies of the agriculture of specific countries or regions.
- Case studies of selected cropping systems: particularly rice, maize, oilseeds & cash crops (e.g. sugar): their agronomy, global importance, competition and markets.
- Case studies of selected animal production systems: particularly beef and poultry production: their husbandry, global importance, competition and markets.
- Impact of modern biotechnology on world trade and production.
Integrated Countryside Management (CH007)

Credit Value: 15
Pre-requisites: None

Rationale and Context:
Students will already have studied modules which require them to appraise individual land-use enterprises, investigate the environmental consequences of such systems and develop strategies for the management of specific problems. However, in practice, rural land use will need to involve the integration of agricultural and woodland systems with conservation and amenity considerations into overall countryside management. In the module **Integrated Countryside Management** the student will be challenged to resolve conflicts between the various land-use opportunities to produce integrated management plans which cover the requirements of environmental legislation and, as far as practically possible, utilise land to maximum social, ecological and economic benefit.

Intended Learning Outcomes:

1. Discuss the complexity of rural land-use and the need to apply appropriate integrated countryside management techniques.
2. Analyse, evaluate and debate land-use problems and propose solutions appropriate to the objectives of the client and the circumstances of each case.
3. Create management plans for sites, including the reconciliation of conflicting uses for those sites.
4. Effectively communicate evaluation and recommendations orally and in writing.

Indicative Content:

- **Sustainable Development.** Implications for land use and management. Responsibility for managing the countryside: land ownership; stewardship as a philosophy of land management; state involvement. Need for an integrated approach to multi-purpose land management.

- **Sustainable Agriculture.** Sustainable farming systems. Organic farming. Integrated crop management. Land and farm management in upland and marginal areas and areas designated as ESAs, NSAs, NVZs, SSSIs and land included in Countryside Stewardship schemes.

- **Tourism, Recreation and Amenity Land Use.** Growth of recreation and tourism and issues arising. Development of tourism and recreation policies and national and local levels. The need for a sustainable management approach. Public access to the countryside.

- **Conservation Designations.** National Parks, AONBs, SSSIs and other designations. Implications for land management.

- **Countryside Management.** Rural Estate Management. Resolving conflicting land use issues. Countryside Management in public, private and voluntary sector contexts. Grant aid and other assistance for land management and enhancement.
Post Harvest Technology (CH006)

Credit Value: 15
Pre-requisites: Crop Production Systems
               Mechanisation Systems

Rationale and Context:
Incorrect storage and handling practices after harvest may cause a large and unnecessary loss of produce. This module provides the basis for effective crop conservation and storage together with a reduction of wastage and loss of quality by developing the understanding of the nature and causes of losses and how they may be overcome.

Intended Learning Outcomes:
1. Assess the factors influencing post harvest quality of crops.
2. Review the requirements for maintaining post harvest quality.
3. Evaluate the requirements for successful crop storage and processing.

Indicative Content:
- **Post harvest quality**: physical, physiological and microbiological changes.
- **Crop quality**: methods for assessment and quantification.
- **Supplementary treatments**: physical or chemical treatment at, or post harvest.
- **Building design**: crop stores, handling and grading systems.
- **Assured production**: crop production, storage and processing quality management and food safety requirements.
- **Economic implications**: storage costs and the implications of wastage and loss.
- **Post harvest strategies**: a critical analysis.
Sustainable Farming (CH001)

Credit Value: 15
Pre-requisites: Crop Production Systems

Rationale and Context:
Integrated Pest Management (IPM) was developed as a concept for the integrated control of a particular pest/crop scenario in the 1980's. This has been developed into a whole farm system in the 1990's through Integrated Crop Management (ICM), which is a holistic approach producing safe, wholesome food in an environmentally sensitive manner whilst maintaining profitability. This module studies the concepts of Integrated Pest Management/Integrated Crop Management/Integrated Farming Systems, their relationship with quality assurance schemes (Assured Fresh Produce, Assured Combinable Crops, FABL, etc..) and the requirement for traceability in modern agri-businesses. The place for organic production systems as a means of achieving sustainable agriculture will also be addressed.

The student will develop the ability to formulate whole farm cropping systems that integrate crop technology, economic management, and environmentally sensitive practices which are sustainable. The concept of Sustainable Farming Systems not only addresses all the issues involved in IPM/ICM/IFS/Organic Farming, but also embraces a further stage where the future viability of farming is considered from a regional, national and international perspective. This not only takes into account the biological and economic viability, but also the social implications of farming policy on the rural economy and environment.

Intended Learning Outcomes:
1. Understand the inter-relationship between IPM, ICM, IFS, Organic Farming and Sustainable Farming Systems and how these concepts can be incorporated into agri-businesses.

Indicative Content:
- **Sustainable Farming Systems:** Integration of specific crops into a profitable crop rotation that conforms to ICM and IPM principles and meets the requirements of assurance schemes and traceability in the food chain. Environmental impact of agrochemicals. Consequences of IPM and ICM concepts. The value of natural ecosystems (eg. field margins, beetle banks, etc..) in pest control management, implications of agri-environmental schemes and set-aside.
Engineering
Advanced Off Road Vehicle Design (E6001)

Credit Value: 15
Pre-requisites: Vehicle Technology, Off Road Vehicle Design, Off Road Vehicle Technology

Rationale and Context:
This specialist module for MEng, BEng and BSc Off Road Vehicle Design students further develops their understanding of the principles of off road vehicle ride and stability. It builds on material covered in the Off Road Vehicles, Terramechanics and Off Road Vehicle Design modules and provides students with the opportunity to develop their ability to design off-road vehicle chassis and suspension systems. It also consolidates and extends the students’ understanding of the control and dynamic behaviour of wheel and track systems in the off-highway environment.

Intended Learning Outcomes:
1) Design a suspension system for an off-road vehicle
2) Analyse and critically evaluate the effects of chassis and suspension design on the ride and handling of an off-road vehicle
3) Apply mathematical models and computer software to predict the ride quality of off-road vehicles
4) Analyse and critically evaluate the effects of active stability and ride control systems
5) Apply mathematical models and computer software to predict the dynamic stability of off-road vehicles

Indicative Content:
- **Ride and Handling**: Quantifying vehicle ride and handling parameters. Dynamic wheel and track behaviour in the off-highway environment. Wheel control using passive suspension systems. The effects of steering on wheel and track forces and vehicle dynamics. The effects of braking on wheel and track forces and vehicle dynamics. The effect of suspension design and vehicle dynamic behaviour on Whole Body Vibration and occupant comfort and safety.
- **Active stability and ride control**: Active and semi-active suspension systems, active stability control systems, Electronic Traction Control, Anti-lock Braking Systems, Electronic Brake Distribution, active roll control systems
Advanced Off Road Vehicle Technology (EH010)

Credit Value: 15
Pre-requisites: Vehicles and Traction
               Off Road Vehicle Technology

Rationale and Context:
This is a specialist module for BSc / BSc Honours Off Road Vehicle Technology. This is an integrating module which focuses on the engineering problems experienced in vehicle design and development. The module will use a small number of keynote lectures, visiting speakers and visits to review and consider some of these areas. The assignment will be launched at the start of the module and involve a design or test problem or an engineering investigation. Each student will have a different assignment problem. A high proportion of the assignment problems will be sourced from industry.

Intended Learning Outcomes:
1. Test, measure and evaluate machine electronic control systems.
2. Test, measure and evaluate the mechanics, handling and performance of off road vehicles.
3. Develop and evaluate that design or configuration of a vehicle, or part of a vehicle.
4. Test, measure and evaluate the ergonomic performance of off road vehicles.
5. Apply engineering software to model problems in off road vehicle design.

Indicative Content:
Keynote lectures, visiting speakers and visits to review and consider aspects of electronics and control systems, the measurement, analysis and evaluation of ride vibration and NVH, suspension design and analysis, software modelling of vehicles, vehicle mechanics problems, design problems and terramechanics. Design test and development areas of current concern and interest will be used where possible.

An introduction to 3D vehicle modelling software (ADAMS/VisualNastran).
Control Systems and Mechatronics (EH005)

Credit Value: 15
Pre-requisites: Fluid Power and Electrical Technology
Instrumentation and Control

Rationale and Context:
Mechatronics is the non-trivial combination of mechanical, hydraulic, electronic and information engineering in the design of products or systems to give better value. Most agricultural machinery and off-road vehicles now contain multiple microcontrollers linked by a common bus system. Students need to understand the principles of operation of microcontrollers, how they interface to external hardware and how bus systems are used to connect them together.

This module, designed for MEng and BEng students, builds on the electrics, hydraulics, instrumentation and control covered previously in Fluid Power and Electrical Technology and Instrumentation and Control. It uses a more analytical approach than the equivalent BSc module.

Intended Learning Outcomes:
1. Design, build and test a single sided microcontroller board.
2. Interface a microcontroller with transducers for data collection and control.
3. Programme a simple control routine in an object orientated language.
4. Critically evaluate a range of controllers for a specific application.
5. Evaluate and appraise the use of bus systems on agricultural and off-road vehicles.

Indicative Content:
- **Microcontroller board**: Based around the PIC microcontroller.
- **Microcontrollers**: PIC microcontroller board & commercially available programmable microcontrollers such as the Parker IQAN system and the Crouzet Millenium II.
- **Interfaces**: Analogue and digital input, digital output to high side drivers.
- **Transducers**: Potentiometers, LVDT’s, solenoid valves, etc.
- **Bus Systems**: ISO 11783 agricultural CAN Bus and J1939 truck and bus CAN Bus.
Electronic Systems (EH007)

Credit Value: 15
Pre-requisites: Hydraulic and Electrical Technology, Measurement and Control

Rationale and Context:
Mechatronics is the non-trivial combination of mechanical, hydraulic, electronic and information engineering in the design of products or systems to give better value. Most agricultural machinery and off-road vehicles now contain multiple microcontrollers linked by a common bus system. Students need to understand the principles of operation of microcontrollers, how they interface to external hardware and how bus systems are used to connect them together. Students also need to be responsive to the increasing use of, and possibilities for, field robotics in agricultural and off-road applications.

This module, designed for BSc students, builds on the electrics, hydraulics and instrumentation covered previously in Hydraulic and Electrical Technology and Measurement and Control. It uses a less analytical approach than the equivalent MEng / BEng module.

Intended Learning Outcomes:
1. Design, build and test a single sided microcontroller board.
2. Interface a microcontroller with transducers for data collection and control.
3. Programme a simple control routine in an object orientated language.
4. Investigate a range of controllers for a specific application.
5. Evaluate and appraise the use of robotics for agricultural and off-road applications.

Indicative Content:
- **Microcontroller board**: Based around the PICAxe microcontroller
- **Microcontrollers**: PIC microcontroller board & commercially available programmable microcontrollers such as the Saure Danfoss PLUS+1 system and the Crouzet Millenium 3.
- **Interfaces**: Analogue and digital input, digital output to high side drivers.
- **Transducers**: Potentiometers, pressure sensors, LVDT’s, solenoid valves, etc.
Engineering Mechanics (EH003)

Credit Value: 15
Pre-requisites: Engineering Mechanics

Rationale and Context:
This module extends the treatment of stress analysis to more complex situations and deals with the vibration of multi-degree of freedom systems. Some structural analysis and design of specific machine components are undertaken. The module also deals with the principles of heat transfer in an engineering context. This module is designed for MEng and BEng students bringing more analytical and mathematical rigour to the subject material than does the equivalent module for BSc orFdSc / HND.

Intended Learning Outcomes:
1. Analyse stresses in a variety of complex stress situations.
2. Evaluate fatigue properties of components using appropriate software.
3. Determine loads and deflections in built-in beams and propped cantilevers.
4. Analyse free, damped and forced vibrations in multi-degree of freedom systems.
5. Solve problems involving design of rotating systems.
6. Evaluate the air conditioning requirements for buildings and vehicles.

Indicative Content:

- **Stress Analysis**: Shear stress distribution in beams, shear centre. Stresses in thick cylinders, compound cylinders, shrink fits. Fatigue analysis, factors affecting fatigue life, life calculations. Unsymmetrical bending stresses.

- **Structural Analysis**: Deflection of built-in beams, propped cantilevers carrying point and uniformly distributed loads. Strain energy methods for deflections in straight and thin curved beams.

- **Vibration Analysis**: Free, damped and forced vibrations of multi-degree of freedom systems. Lateral vibrations and whirling of shafts.

- **Machines**: Gyroscopes. Turning Moment Diagrams/flywheel design.

Engineering Technology (EH008)

Credit Value: 15
Pre-requisites: Engineering Science

Rationale and Context:
This module is designed for BSc students and the intention is to instil an awareness and general understanding of particular engineering phenomena with less emphasis on mathematical problem solving than is the province of MEng and BEng students. The module extends the knowledge of stress distribution to more complex situations and deals with further dynamics topics not previously covered in the pre-requisite module. Some structural analysis and design of specific machine components are undertaken. The module also deals with the principles of heat transfer in an engineering context.

Intended Learning Outcomes:
1. Determine the stress distribution in a variety of complex stress situations.
2. Use software to evaluate fatigue properties of components.
3. Specify the advantages and disadvantages of built-in beams and propped cantilevers.
4. Apply a knowledge of free, damped and forced vibrations in multi-degree of freedom systems to the design of vibration sensitive components.
5. Solve problems involving design of rotating systems.
6. Review the air conditioning requirements for buildings and vehicles.

Indicative Content:
- **Stress Analysis**: Shear stress distribution in beams, shear centre. Stresses in thick cylinders, compound cylinders, shrink fits. Fatigue analysis, factors affecting fatigue life, life calculations. Unsymmetrical bending stresses.
- **Structural Analysis**: Deflection of built-in beams, propped cantilevers carrying point and uniformly distributed loads.
- **Vibration Analysis**: Free, damped and forced vibrations of multi-degree of freedom systems. Lateral vibrations and whirling of shafts.
- **Machines**: Gyroscopes. Turning Moment Diagrams/flywheel design.
Field Engineering (EH004)

Credit Value: 15
Pre-requisites: Terramechanics
Building Design, Soil and Water Technology

Rationale and Context:
This module will develop some of the ideas established in the subject of soil and water technology studied at Intermediate Level. This module will enable students to relate soil properties to production constraints and their prevention or correction throughout the world by means of drainage, irrigation and erosion control.

Intended Learning Outcomes:

1. Design small scale open channel waterways and control and flood management structures.
2. Design and critically evaluate systems to overcome problems of soil water deficit that are legal and economically viable.
3. Design and critically evaluate suitable systems to remove excess soil water.
4. Analyse and evaluate agronomic and environmental problems initiated by soil water supply and its sustainability and resilience.

Indicative Content:

- **Open channel flow**: channel design; flow calculation; hydrograph analysis; control structures; reservoir design.
- **Irrigation**: calculation of soil water deficit; methods of water and separated slurry storage, supply and application; calculation of system power requirement and operating costs; design of matched system for a given situation; legal implications of abstracting and impounding water in the UK; water pollution problems caused by irrigation; noise and visual impact of irrigation.
- **Land drainage**: soil-water movement as a hydraulic system; above ground and below ground drainage: calculate drain spacing for non-steady state situations; types of drainage installation machinery; backfill; design of a specific scheme for a given site; the effect of drainage on the landscape and its wildlife habitats.
- **Soil Erosion**: Soil erosion by wind and water.
Group Enterprise Project (EH001)

Credit Value: 15
Pre-requisites: None

Rationale and Context:
The module aims to give the student experience of involvement in a team when tackling a multi-disciplinary problem. It will relate prior learning to the management and execution of a defined multi-disciplinary project.

Intended Learning Outcomes:
1. Apportion a workload within a team, making the best use of available expertise.
2. Plan and progress a project carried out by a group of personnel.
3. Structure a written report calling on activity from each member of the group.
4. Reach conclusions based on a consensus opinion.

Indicative Content:
A problem will be presented to a group of 4 or 5 students. This will either be sourced from, or simulate as closely as possible, a situation in the Agricultural Engineering Industry.

Background information, details of the problem, specialist responsibilities and references will be given to the group at the outset. In addition to the final report any other requirements will be detailed. Tutorials on project management and additional educational material will be provided by the supervising staff as required.
Management of Design (EH009)

Credit Value: 15
Pre-requisites: Any Intermediate Level Design Module

Rationale and Context:
This module has been designed for those engineering students taking ‘Engineering Design and Development’. The module is aimed at students who will progress to take part in the Management of, and have responsibility for the design function in engineering companies.

Intended Learning Outcomes:
1. Formulate strategic policy for new product introduction in an engineering company.
2. Identify and plan resources required to support new product introduction in an engineering company.
3. Identify and plan procedures and controls (design systems) to ensure successful introduction of a new product in an engineering company.

Indicative Content:
- Legal aspects of new product introduction (product liability, homologation, EC directives etc).
- Use and applicability of design codes.
- Methods and techniques for risk assessment.
- Management of design systems: eg the manual drawing office, 2 and 3D CAD, Product lifecycle management systems.
- Market analysis for new product introduction opportunities.
- Product support and warranty systems.
- Cost and funding for design.
- Leadership and project management for new product introduction (incorporating HRM).
Measurement and Control (EH000)

Credit Value: 15
Pre-requisites: Hydraulic Power and Electrics

Rationale and Context:
This module builds upon the principles of electrical science studied at the intermediate level in 'Hydraulic Power and Electrics'. It covers the range of instrumentation used for engineering data acquisition and investigates the use of Programmable Logic Controllers (PLCs) for control. It also investigates the use of Global Positioning Systems, automatic steering and agricultural field robotics, and introduces the students to common control methodology.

Intended Learning Outcomes:

1. Select a suitable instrumentation system, apply it to a given task and evaluate its effectiveness.
2. Evaluate collected data for reliability, noise and resolution.
3. Programme a PLC to perform a given task.
4. Appraise the appropriateness of a control system for a given task.
5. Assess the suitability of agricultural field robots for a particular job.

Indicative Content:

- **Instrumentation system**: Sensors, signal conditioning, Computer interface electronics, and display or recording devices.
- **Sensors**: Temperature, pressure, humidity, distance, velocity, acceleration, light, heat, radiation, sound, force, fluid flow, liquid level, strain, etc.
- **Signal conditioning**: Voltage dividers, Wheatstone bridge circuits, and instrumentation amplifiers.
- **Computer interface electronics**: Digital input/output lines, analogue to digital and digital to analogue circuits.
- **Data conversion**: Sample rate selection, resolution of analogue to digital conversion.
- **Control system**: Open and closed loop systems. Object Orientated PLC control.
Product Development and Testing (EH002)

Credit Value: 15

Pre-requisites: Introduction to Business or equivalent
              Instrumentation and Control or equivalent
              Applied Mechanics or equivalent

Rationale and Context:
This module is seen as an integrating subject that expands on previous studies. The validation of product design will form a large part of the job description of many graduates.

Intended Learning Outcomes:
1. Demonstrate the ability to work within some of the financial and business constraints imposed on the product development engineer.
2. Produce a product development plan covering costs, labour and equipment requirements.
3. Predict the life of a welded component subjected to dynamic loading.
4. Design a test rig for a simple component.
5. Comment on the need to consider the total product life including final disposal.

Indicative Content:
- Innovation and invention.
- Financial and marketing constraints, product costing.
- Design Quality: FMEA, QFD, Benchmarking.
- Reducing time to Market: concurrent engineering, dedicated product teams, rapid prototyping.
- Product Failure: fatigue corrosion and wear. Design of welded structures to extend fatigue life.
- Product Testing: field, rig and "virtual world" testing.
- Test programme management.
- Data acquisition and processing.
- Warranty and product development.
- Final product disposal - design for recycling.
Renewable Energy Technologies (EH013)

Credit Value: 15
Pre-requisites: Engineering Science or Solid Mechanics

Rationale and Context:
Energy supply from renewable sources is essential to preserve the environment and maintain sustainability. This module broadens a student’s knowledge of different renewable energy technologies and provides them with an understanding of the scientific principles behind the machinery. This module covers equipment for power generation from wind, water, biomass and other continuing sources and provides students with a sound background in the engineering technology behind renewable resource management so that students can carry out appropriate calculations to size, for example, solar water heating systems or select the appropriate type of water turbine to match the available “head” and flow rate of the water source.

This module, designed for MEng and BSc students, uses and extends the underpinning knowledge gained in the intermediate level module Engineering Science/ Solid Mechanics.

Intended Learning Outcomes:
1. Appraise the scientific principles underpinning the technologies used to generate, transmit and store energy from renewable sources.
2. Determine the power outputs and efficiencies of renewable energy systems.
3. Establish the power train requirements for a range of renewable energy systems.
4. Critically evaluate the impact of renewable energy systems on the UK economy, society and environment.

Indicative Content:
- **Renewable energy sources**: Solar, biomass, wind, geothermal and water.
- **Technologies**: Solar water heating, photovoltaic, biomass and bio-fuels, wind powered machinery, ocean and geothermal systems, hydropower, wave power, tidal power, and energy storage and transmission systems. Environmental and sustainability issues.
- **Scientific principles**: Systems, laws of thermodynamics, heat exchangers, combustion, heat transfer, turbines, solar radiation, photovoltaic generation, electricity generation, characteristics of wind, anaerobic digestion, wave energy and power, geothermal energy, fuel cells, mechanical transmission systems and fluid dynamics.
Rural Affairs and the Environment
Agricultural Business Development (RH021)

Credit Value: 15
Pre-requisites: Farm Business Management and Economics
                Farm Business Management & Policy

Rationale and Context:
The ability to take an overview and plan whole farm systems which integrate technical
business and managerial aspects is a key managerial skill. This project based module is the
main vehicle to enable students to draw on their earlier module knowledge and use it in the
creation of plans for a live farm business situation, as well as add to their farm business
planning skills and knowledge. These skills are developed within an understanding of the
global economic environment and using a strategic approach. The planning exercise also
requires students to use current planning environmental constraints and plan within a
dynamic context.

Intended Learning Outcomes:
1. Critically analyse agricultural production and marketing systems.
2. Identify problems associated with production, finance, staffing, business strategy and
   marketing.
3. Formulate objectives for farm business management situations and create plans for
   future business development which synthesise internal, external and intrinsic factors.
4. Evaluate situations in relation to the needs of the industry and its personnel, the
   consumer and the environment.
5. Understand the wider economic and political situation and their effects on developing
   the farm business.

Indicative Content:
- **Farm business development techniques:** revision, updating and additions
- **Planning environment factors:** briefing
- **Business planning achievement factors:** business health, sustainability of plans,
environmental impacts
- **Economical policy in a global environment:** European and national policy
  including changes in the Common Agricultural Policy
- **Business Strategy factors:** suitability, feasibility and acceptability and
  product/market matrix.
Agricultural Tenancy Law (RH006)

Credit Value: 15
Pre-requisites: Law for Estate Managers

Rationale and Context:
A sound understanding and a high level of competence in agricultural holdings law is an essential requirement for a rural practice chartered surveyor. Other rural land managers also need to understand the agricultural landlord-tenant system and its implications for rural land management. The module considers in depth the law as it relates to those tenancies regulated by the Agricultural Holdings Act 1986 and those by the Agricultural Tenancies Act 1995. Through the use of case studies the relevance and practical application of the law is thoroughly examined.

Intended Learning Outcomes:
1. Analyse the legal relationship between landlords and tenants of agricultural holdings, evaluating sources of law that regulate that relationship.
2. Synthesise legal theory with practice in the commonly encountered professional areas of rent review, tenancy succession, compensation and repairing obligations.
3. Formulate Heads of Terms for inclusion in a farm business tenancy.
4. Analyse disputes which may arise between landlord and tenant with regard to formal and informal means of dispute resolution.

Indicative Content:
Agricultural Holdings Act 1986

- **Historical background** to the development of agricultural holdings law. The meaning of "agriculture" within the context of the Agricultural Holdings Act 1986. Arrangements falling outside the definition of an agricultural tenancy.

- **The terms of the tenancy:** The sources of the tenancy terms. Obligations of the tenant and the landlord as determined by the tenancy contract, statutory law and case law. The intervention of statutory law.

- **Rent reviews:** The frequency of rent reviews. The statutory right to demand arbitration. Determination of the "rent properly payable". Effect of landlord's and tenant's improvements. Non-payment of rent and the rights of distress.

- **Security of tenure:** Notices to quit and counter notices. Incontestable notices to quit. Termination other than by notices to quit.

- **Tenancy succession:** Succession on death and retirement. Tests of eligibility and suitability.

- **Compensation entitlement at the termination of the tenancy:** The tenant's claims for disturbance, long term improvements, short term improvements, tenant right matters. Claim for compensation for interest in milk quota under the Agriculture Act 1986. The landlord's claims for dilapidations.

- **Disputes.** Settlement of disputes by arbitration and by the Agricultural Lands Tribunal. Alternative Dispute Resolution (ADR), Mediation, Tenancy Reform Industry Group.
Farm Business Tenancies (Agricultural Tenancies Act 1995)

- **Protection of tenancies existing prior to the 1995 Act:** Pre-agreed 1986 Act tenancies, variations of existing lettings, succession.

- **Termination of Farm Business Tenancies:** Termination of fixed terms of two years or less. Termination of fixed terms of more than two years. Termination of tenancies from year to year and other periodic tenancies.

- **Rent reviews:** Rent review procedure. Notice requiring statutory rent review. Frequency of rent reviews. Appointment of arbitrator. Determining the amount of rent.

- **Compensation on the termination of a Farm Business Tenancy:** Tenant's entitlement to compensation for tenant's improvements. Conditions to be satisfied for entitlement to compensation. Amount of compensation.


- **Other miscellaneous and supplemental matters:** Mortgages of agricultural land. Preparation of documents by surveyors.
Applied Ecology (RH017)

Credit Value: 15
Pre-requisites: Introduction to Ecology
Wildlife & Conservation Management or Habitat Management

Rationale and Context:
Humans depend upon biodiversity for their continued existence and the high rates of loss have been the subject of considerable concern in recent years. In order that biodiversity may be exploited sustainably, it is important that there is a good understanding of how populations and communities of organisms function and also how they react to forms of human induced disturbance. This module is designed to provide students with an initial background to the complexities of community organization and the general factors that affect community stability. The module then demonstrates how ecological science can be applied to real world conservation problems and situations such as the design of nature reserves and the sustainable harvesting of populations.

Intended Learning Outcomes:
1. Define the structure and levels of organisation within an ecological community.
2. Evaluate the factors affecting community stability
3. Appraise the major theoretical principles of ecology and application to real world situations.
4. Assess the contribution of ecologists to sustainable development.

Indicative Content:
- **Communities:** stability, structure, food webs, guilds, assessment and ordination techniques.
- **Harvesting:** ecology of shooting, fishing and culling; sustainable exploitation
- **Conservation:** species-area relationships and the design of nature reserves, minimum viable population size, conservation strategies.
- **Plant-herbivore relationships:** ecology of pests, introduction of non-indigenous organisms; biological control.
Rationale and Context:
This module builds on earlier studies in Law for Estate Managers and Professional Practice by extending the knowledge of students in the areas of residential and business tenancy law and land law. Residential and business tenancy law is an important area to the rural land manager, who may be concerned with the management of domestic and non-agricultural business properties. The studies in Land Law develop the subject, introduced in the module Law for Estate Managers, and focuses on those interests that can exist in land and which influence its management. The module also underpins final year studies in Revenue Law and Statutory Valuation and Estate and Business Strategy.

Intended Learning Outcomes:
1. Appraise the requirements of the law as it applies to tenancies of commercial and residential property:
2. Review the implications of these requirements as they affect the management of commercial and residential property:
3. Evaluate the legal and equitable interests that can exist in land:
4. Assess the extent to which these interests may affect the use and management of land.

Indicative Content:
- **Rent Review**: Clauses, obtaining comparables, analysis, negotiations and procedures, disputes arbitrations and experts.
- **Leasehold enfranchisement**: Historical development. Leasehold Reform. Housing and Urban Development Act 1993, other legislation and its impact on the housing market.
- **Studies in Land Law**: Covenants - freehold and leasehold covenants. The running burden and benefit in freehold covenants. Modification and discharge of covenants.
- **Easement**: characteristics of an easement, acquisition of easement. Profits a pendre.
- **Mortgages**: Creation of mortgages, rights of the mortgagor and mortgagee. Mortgage priorities.
- **Co-ownership**: forms of co-ownership, severance, sale of co-owned land.
- **Adverse possession**: the operation and nature of adverse possession.
- **Limited ownership**: settlements and trusts for sale.
Countryside Interpretation, Education and Visitor Management (RH011)

Credit Value: 15
Pre-requisites: Countryside Recreation and Land Management

Rationale and Context:
The aim of the module is to equip students with skills and understanding of specific techniques for managing visitors, through countryside interpretation, education and management planning. Through the examination of both current best practice and professional skills, students will be enabled to actively manage the both the physical and visitor environment and minimise the impact of the latter whilst making a positive contribution to social and environmental development and education.

Intended Learning Outcomes:
Students successfully completing programme requirements at this level will be able to:

1. Assess the environmental impact of visitors and the carrying capacity and limits of acceptable change for a given area or site;
2. Evaluate a given site and relevant leisure activities and put forward a reasoned package of visitor management and interpretation measures;
3. Develop management plans and operating programmes for a given site or leisure activity;
4. Develop an environmental education package to meet given requirements.

Indicative Content:
- **Countryside Education.** Development of environmental education. Environmental education in relation to the educational system of England and Wales. Different teaching and learning methods in relation to individual groups and situations. Planning and appraisal of environmental education activities. Design of interpretative material for different situations and audiences.
- **Visitor Management.** Environmental impacts of visitors. Obtaining data from surveys and other information: techniques, sources and analysis. Recreational carrying capacity and limits of acceptable change. Principles and techniques of visitor management. Acceptability of pricing and prohibition as visitor management techniques. Case studies of specific sports, recreation and other visitor attractions: analysis of characteristics of specific activities and attractions and consideration of appropriate policies.
- **Countryside Interpretation.** Principles of countryside interpretation. Interpretative planning and interpretation as a tool for visitor management. Design and production of panels, signs and other material. Interpretative media, trail guides, guided walks programmes, living history and re-enactment.
- **Management Planning.** Developing Management Plans for sites. Planning for projects and enterprises (e.g. feasibility, design, location and management of visitor centres). Managing sites: training/managing staff and volunteers; maintenance planning; disabled access, health and safety of staff and visitors; events programmes; promotion and marketing.
Economic Policy and Rural Development (RH008)

Credit Value: 15
Pre-requisites: Principles of Rural Development and Land Use

Rationale and Context:
This module is concerned with the adoption and evolution of macroeconomic policy, the underlying factors that affect it and the influence that it has on the UK generally and agriculture and rural development in particular. The international interdependence of the modern world economy will be examined and the implications, particularly for rural areas will be discussed. The influence of national and supra national government policy on the environment will also be considered. This module is the culmination of the Rural Economy and Diversification theme on the REALM course.

Intended Learning Outcomes:
On completion of this module students will be able to:
1. Critically examine government policy towards trade and economic integration.
2. Suggest alternative economic policies to meet the goals of sustainable development.
3. Evaluate the effectiveness of economic and environmental policies and taxes, including the operation of Common Agricultural Policy and any changes proposed to it.
4. Appraise the methods used to distribute EU structural funds to disadvantaged rural areas.

Indicative Content:
- **Macroeconomic Policy:** Monetary policy and fiscal policy; the circular flow of income; ideas behind the business cycle; economic forecasts and cyclical indicators; unemployment, inflation and the balance of payments; public finance; exchange rates and interest rates; politics and economic policy; investment and savings.
- **Non market and public goods:** externalities and market failure.
- **The European Union:** Membership and institutions; theory of international trade based upon comparative advantage; GATT and WTO, tariffs and non-tariff barriers to trade, customs versus free trade areas; economic, monetary and political integration (ERM, EMU and the Maastricht treaty).
- **Agricultural and Environmental Policy:** Pressure for reform of the CAP; current proposals for CAP reform, environmental aspects of the reformed CAP, the use of green taxes to meet environmental objectives. EU and Environment Policy.
- **Rural Development:** Links between the CAP and the Rural Development Plan; the main EU structural funds supporting rural development and how they are targeted and distributed; indicators used to identify Objective 1 and 2 areas. UK examples of rural development using EU structural funds.
Environmental and Social Business Strategy (RH015)

Credit Value: 15
Pre-requisites: None

Rationale and Context:
The growing awareness by consumers and policy makers regarding environmental and social issues can no longer be ignored by the business community. Managers now require a range of skills to make effective decisions concerning their business activity, society and the environment. This module considers the manner in which social and environmental problems are incorporated into corporate strategy and implemented within businesses to deliver both responsible business and responsible organisations. The European Commission’s working definition of CSR is “a concept whereby companies integrate social and environmental concerns in their business operations and in their interactions with their stakeholders on a voluntary basis.” The module builds upon existing skills and introduces different techniques for the incorporation of environmental and social values into the corporate decision-making process.

Intended Learning Outcomes:
1. Appreciate the factors driving social and environmental responsibility;
2. Critically appraise the impact of integrating environmental and social considerations into business and organisational decision-making;
3. Evaluate environmental management practices within organisations;
4. Critically review current literature relating to CSR and Environmental Management.

Indicative Content:
- **Corporate social responsibility** – drivers of CSR, elements of CRS (environment and social) and its implementation by companies and organisations. Consideration of social auditing, stakeholders, global and local environmental concerns. CSR in SMEs and non profit organisations, ethical trading.
- **Environmental management in the context of sustainable development.** Policy and practice at the national, project, product and organisational and individual levels. Market mechanisms for achieving environmental improvement. **Life cycle analysis** and **ISO 14001** and their application.
Environmental Assessment and Management (RH002)

Credit Value: 15
Pre-requisites: Planning and Environmental Law and Practice, or Land Use Policy and Practice; and Introduction to Ecology

Rationale and Context:
Businesses and organisations increasingly need to consider the effect of their operations on the environment. Assessment of the impact of major development projects on the environment has been a statutory requirement in the UK since 1988, while the principles of sustainable development continue to pervade government policy following the Rio Earth Summit in 1992 and the adoption of the Fifth Environmental Action Plan “Towards Sustainability” by the European Union in 1993.

The general public is also becoming more environmentally aware, seeking environmental information to make more informed consumer choices. This module studies the environmental impacts associated with business systems, plans, programmes and projects.

It introduces Environmental Management Systems and studies in detail Environmental Impact Assessment and Strategic Environmental Assessment in terms of legislative compliance and environmental protection and develops conservation, environment and planning themes from the earlier modules Introduction to Ecology and Planning and Environmental Law and Practice.

Intended Learning Outcomes:

1. Review and evaluate the potential environmental impacts of business and economic activity, of strategic plans and programmes and development projects.
2. Assess the potential environmental impacts of developments within the countryside.
3. Effectively communicate findings orally and in writing to peers, staff and professionals.
4. Evaluate current literature relating to Environmental Impact Assessment and Strategic Environmental Assessment

Indicative Content:

- **Introduction to the law and theory relating to environmental assessment:** Study of the Town and Country Planning Regulations relating to Environmental Impact Assessment (EIA) and of the regulations relating to EIA for projects falling outside the Town and Country Planning system.

- **Environmental Impact Assessment in practice:**
  - Scoping, screening, baseline assessment, assessment of environmental effects, monitoring, mitigation, and review. Critical review of current literature relating to the monitoring of the EIA process.

- **Environmental Management System:**
  - Introduction to the core elements of environmental management systems (further detail provided in the Environmental and Social Business Strategy optional module)

- **Strategic Environmental Assessment (SEA):**
  - Study of EU and UK legislation relating to SEA; review the processes of undertaking SEA within different organisations and for different plans and programmes.

- **Choice and application of techniques employed in EIA:** Risk assessment, ecological sampling, landscape assessment, GIS.
Environmental Business Strategy and Management (RH015)

Credit Value: 15
Pre-requisites: Planning and Environmental Law & Practice

Rationale and Context:
All economic activity uses environmental resources. Examples would include agriculture in altering the pattern of the landscape and the air pollution caused by the road freight industry. A growing awareness by consumers and retailers regarding issues of health and the environment can no longer be ignored by the business community. Managers now require a range of skills to make effective decisions concerning their business activity and the environment. This module therefore builds upon existing skills and introduces different techniques for the incorporation of environmental values into the corporate decision-making process. These skills are developed and applied through a group project that draws on real case studies.

Intended Learning Outcomes:
1. Develop the application of existing skills;
2. Appreciate the important role of the environment in decision-making;
3. Analyse the importance of the environmental strategy of an organisation in the context of other key business strategies;
4. Undertake an integrated group project and present the results.
5. Evaluate the significance of the environment as an aspect of sustainable development at national and organisational levels;
6. Undertake a lifecycle analysis of a consumer product and consider the significance of this to the commercial success of the product.

Indicative Content:
- **The main issues regarding the environment in a commercial context.** Introduction of present value and total economic value. Techniques for the valuing the environment and their incorporation in business strategy and planning. Group planning of a research project, collecting of primary data and a presentation of the results together with their implications for a business strategy.
- **Environmental management in the context of sustainable development.** Policy and practice at the national, project, product and organisational and individual levels.
- **ISO 14000** and its application.
- **Life cycle analysis.**
- **Agenda 21 and its objectives** by countries at differing stages of economic development.
- **Market mechanisms** for achieving environmental improvement.
Expedition Development (RH020)

Credit Value: 30
Pre-requisites: Advanced Outdoor Activities

Rationale and Context:
The opportunity to undertake a self-organised themed expedition allows students to apply the broad range of skills and knowledge acquired at Certificate and Intermediate level. Planning, execution and evaluation of the expedition, will incorporate risk management, finance, sustainability concerns and operational aspects into a student-centred context.

Intended Learning Outcomes:
1. Design an overseas expedition appropriate to the interests and skill levels of the student group.
2. Apply risk management concepts to a real-life activity.
3. Critically evaluate the degree of sustainability in the chosen expedition.
4. Apply commercial criteria to an evaluation of the expedition.
5. Use and adapt existing theoretical models to review the expedition.
6. Develop a range of media collected on expedition to aid marketing and interpretation of the wider Degree programme.

Indicative Content:
- **Expedition planning**: risk factors, assessment and management, coping with uncertainty, thematic approach, aims and objectives.
- **Finance**: break-even analysis, safety margins, sources of funding, record-keeping.
- **Logistics**: equipment, transport, emergency procedures, communication, personal skills audit, skills gap development.
- **Evaluation and reporting**: use of a range of media including audio, video, still photography. Evaluation techniques – effective logs, peer assessment, benchmarks.
Festival, Convention and Event Management (RH019)

Credit Value: 15
Pre-requisites: Principles of Marketing
Operating Leisure and Tourism Services

Rationale and Context:
The module will examine the importance of events to leisure and tourism organisations. It is designed to enable the student to gain the theoretical knowledge and practical skills required to plan, deliver and evaluate an event. Furthermore, students will gain experience of all aspects of event management through the actual organisation of an event.

Intended Learning Outcomes:
1. Understand and evaluate event management theory
2. Critically evaluate the application of this theory to the leisure and tourism events
3. Demonstrate practical experience of event management
4. Apply appropriate evaluation strategies to the management of events
5. Engage in critical self reflection about their role in the management of an event

Indicative Content:
- The nature and importance of events: the role and impact of events for organisations and destinations. Case studies of events
- Event Management Theory: Conceptualising the event, planning, leadership and human resources, marketing, sponsorship, control and budgeting, legal issues, logistics, evaluation
- The Event: Students placed into groups and organise and deliver an event.
- Evaluation: Students undertake an individual reflection on the event.
Fragile Destinations (RH014)

Credit Value: 15
Pre-requisites: Concepts of Leisure & Tourism

Rationale and Context:
The nature and form of tourism development and management is continually evolving. It is therefore necessary that future managers in the sector have a sound understanding of the socio-economic, political and environmental ethos which supports and promotes the new ‘green’ eco-tourism industries. In particular the student should have an understanding of the methodologies and policies that underpin eco-tourism and the ways in which they may be employed in varying economic and geographical environments.

Intended Learning Outcomes:

1. Critically evaluate the philosophy and practice of eco-tourism within the wider context of sustainable development.
2. Assess the principal legislative and economic processes working to promote and develop eco-tourism.
3. Appraise the operation of eco-tourism ventures through the exploration and socio-economic and environmental evaluation of its implementation within differing economic and geographical situations
4. Attain an understanding of the social and environmental responsibility requirements of eco-tourism and the criteria by which it may be attained and measured in distinct sectors of the economy.

Indicative Content:

- **Society and Resources** environmental and social pressure on resources through tourism and the definitions and dimensions of sustainable development.

- **Policies for Sustainability** The development of green tourism. The role of economic and legislative controls, environmental management, stewardship and technology in ‘greening’ tourism.

- **Tools for achieving and measuring the effectiveness of eco-tourism** Cost-benefit analysis, EIA and environmental audits, environmental policies, standards, codes of conduct etc.

- **Corporate Social and Environmental Responsibility** Eco-tourism and the greening of the mass tourism industry

- **Eco-tourism as a rural business** Development and implementation of a green business marketing and managing strategy

- **Sustainable Rural Environments** Eco-tourism and wider social and environmental sustainability - species and habitat conservation through tourism.
Geographical Information Systems and Land Use (RH013)

Credit Value: 15
Pre-requisites: Introduction to Rural Land Use and Management or similar module

Rationale and Context:
Land management is a multi-faceted process involving agricultural, environmental, recreational and social issues. Geographical Information Systems (GIS) allow easy storage of both spatial and cartographic information such as ownership, field size, soil type, conservation status and are an important tool for resource management. This module will provide students with a comprehensive background to GIS applications in land use and the necessary theoretical principles and techniques. Module emphasis will be placed on developing student competence in the techniques of data input, presentation and manipulation using commercial GIS software.

Intended Learning Outcomes:
1. Understand the principles of cartography and evaluate potential applications of GIS
2. Import map data into a GIS package and add features
3. Execute complex queries within a GIS
4. Devise and produce custom maps and reports from a GIS based on end user requirements

Indicative Content:
- GIS Principles: spatial data, cartography, applications, precision farming, satellite imagery, aerial photography
- GIS software: Advantages and disadvantages of available packages, use of ESRI ArcMap
- Applications: Mapping, databases, attributes, queries, reports
Integrated Land Management (RH003)

Credit Value: 15
Pre-requisites: Farm Business Management, Farm Business Legal

Rationale and Context:
This module is designed to add to students' skills to plan and control a rural estate, and to provide them with a chance to apply knowledge and expertise that they have acquired throughout the course in a vocational context. Through a series of case studies students will be expected to identify problems and key issues in various realistic situations, formulate solutions and present reports. The module will also provide an opportunity for students to obtain experience in some of the more advanced and applied areas of land management.

Intended Learning Outcomes:
1. Analyse land management problems through the application of principles and the use of techniques developed throughout the curriculum;
2. Propose and evaluate solutions to these problems in the light of the objectives of the client and the circumstances of the case;
3. Effectively communicate these solutions in writing to peers, staff and professionals.

Indicative Content:
- **Professional consultancy**: Client objectives, confirmation of instructions, liability and insurance, site inspections, records and file notes, reporting, confidentiality, fees.
- **Valuation of rural property**: Common techniques for the valuation of freehold and tenanted farmland and other rural property. Valuation and appraisal of other assets commonly associated with land transfers, quotas, tenant right, tenant's improvements, live and dead stock.
- **Investment decision making**: Investment appraisal in the context of land acquisition and management. Sources of finance for land acquisition. Financial appraisal of new enterprises, investments and management changes.
- **Policy appraisal and formulation**: Internal and external policy considerations affecting land management decisions. Formulation and appraisal of management policy. Role of different types of management plan in land management. Formulation, implementation and review of management plans and management agreements, examination of DEFRA conservation scheme opportunities.
Managing Countryside Projects (RH012)

Credit Value:  15
Pre-requisites:  Principles of Management

Rationale and Context:
Countryside management practice is increasingly delivered through projects. This is the experience of a range of non-governmental non-profit organisations such as National Parks, Wildlife Trusts, National Trust or with government agencies such as the Countryside Agency. This drive towards project delivery is as a result of funding increasingly becoming linked to short term projects.

The implementation and success of these projects requires a sound understanding of the principals of project management within a non-profit setting. This course aims to give students an understanding of project management required to lead the project planning and implementation process. Students will develop competencies in developing project plans, monitoring their delivery and evaluating their impact. The module will provide training in the principals of project management and the project cycle. It will consider methods such as ‘logframe’ analysis and will review the application of theoretical techniques to individual projects. The use of current funding sources for projects will be explored and incorporated into the project.

Part 1 of this course will be a taught element with students being introduced to the theory of project management and needs analysis. Part 2 will engage students in the practical delivery of a project proposal for industry and will involve independent group work.

Intended Learning Outcomes:
Following completion of this module students will be able to:

1. Discuss the components of the project cycle.
2. Undertake needs analysis through stakeholder participation activities.
3. Analyse, evaluate, develop and monitor project plans.
4. Effectively communicate evaluation and recommendations orally and in writing.

Indicative Content:

- **Introduction**: An overview of the project cycle,
- **Needs analysis and community participation**: stakeholder analysis, assessment of problems and opportunities, SWOT analysis, community participation and consultation, levels of control and participation, empowering/extractive consultation, the art of facilitation, some practical methods.
- **Project planning and proposals**: Logical framework analysis, setting goals and objectives (SMART), network diagrams, inputs and budgets, writing the proposal, risk assessment.
- **Funding**: The fundraising process, researching funding.
- **Project management**: Implementation, programming, milestones, monitoring, and evaluation, reporting, Gantt charts, critical path analysis, project management software (PRINCE, MS Project).
Managing the Countryside (RH009)

Credit Value: 15
Pre-requisites: Wildlife and Conservation Management, or Agriculture and the Environment

Rationale and Context:
This module aims to provide students with a thorough appreciation of the context (policy and organisations) within which countryside management takes place and the mechanisms employed to secure sustainable countryside management. The module will have a global as well as UK focus. Here countryside management will refer both to the management of important landscape and wildlife and the wider countryside.

The course will provide the student with the opportunity to observe linkages between global and European policy and its impact on the delivery of conservation of important areas and the management the wider countryside.

It also looks at how the major rural land uses, agriculture and forestry, can be managed in a more sustainable way and integrated with other land uses in the countryside.

The module will consider the integrated management of the countryside. It therefore looks at a variety of models for countryside management, including at their organisation, objectives, resourcing and outputs.

Intended Learning Outcomes:
1. Critically evaluate the organisational bases for the protection of landscape and biodiversity and for countryside management in the UK and elsewhere and assess the effectiveness of these;
2. Critically evaluate and integrate mechanisms and models (e.g. Agri-environment schemes, forest certification schemes, landscape and wildlife designations) used in the management of the countryside and assess their viability and social, economic and environmental impact.
3. Critically evaluate methods (e.g. community participation, management planning) engaged in the management of the countryside.
4. Effectively and professionally communicate findings orally and verbally.

Indicative Content:
Likely areas within this module include:

- **global/EU/national policy**: organisations involved in countryside management in the UK and internationally;
- **mechanisms for management** including financial, legislative and voluntary with example being British and international;
- **sustainable forestry systems** (forest certification schemes, forest planning);
- **sustainable agricultural systems** (integrated crop management, Nitrate Vulnerable Zones, organic farming, agri-environmental schemes);
- **techniques engaged in countryside management** such as management planning for protected areas and community participation.
Policy and Planning for Leisure and Tourism (RH018)

Credit Value: 15
Pre-requisites: Concepts of Leisure and Tourism
The Leisure and Tourism Industry

Rationale and Context:
This module builds on students' knowledge of public policy for leisure and tourism, which was introduced in the module The Leisure and Tourism Industry. It will develop a deeper understanding of the range of perspectives on social policy and the contemporary debates on the development of leisure and tourism policy, in particular crisis management in the climate of international tourism today. This will enable students to appreciate that effective managers need to make decisions within the context of policy.

Intended Learning Outcomes:
1. Interpret the theoretical basis of public policies for leisure and tourism.
2. Evaluate alternative policy approaches in leisure and tourism
3. Appreciate the implications of public policy for management practice
4. Examine comparative models and examples of leisure and tourism policy and practice from other countries.

Indicative Content:
- Development of public policy: historical development and changing rationales for policy
- Political ideologies and leisure/tourism policies: to include neo-liberalism and anti-collectivism, conservatism and reluctant collectivism, Fabian socialism, Marxism and feminism.
- Implications for management practice: contracting culture, Best Value, and ‘professional’ versus ‘community’ approaches to provision.
- International Perspectives: comparative models and examples of policy and practice from other European and non-European countries including the role of the European Union. The growing importance of crisis management.
Revenue Law and Statutory Valuation (RH004)

Credit Value: 15
Pre-requisites: Valuation Principles and Practice, Taxation

Rationale and Context:
This module is designed to extend earlier studies of taxation and valuation in order that students can tackle complex and novel problems which arise in the course of estate management and professional valuation work. It is particularly concerned with the relationship between legal requirements, valuation methodology, professional responsibility and client requirements, and recognises the constraints and guidelines imposed on valuers by statute, case law and the professional bodies’ statements of practice. In particular students should emerge from the module equipped to undertake complex valuations of the type required for compensation and taxation purposes, and to take a leading role in the process of tax-planning on rural estates.

Intended Learning Outcomes:
1. Structure and solve advanced valuation problems
2. Evaluate the legal, technical and professional constraints within which valuers must work
3. Prepare and negotiate claims under all heads of claim for land being compulsorily acquired
4. Assess the impact of taxation on rural estates, farms and enterprises and identify opportunities for tax avoidance which satisfy a client’s wider objectives.
5. Appraise the adequacy of current statutory valuation frameworks from one or more perspectives

Indicative Content:
- Valuation techniques and their application to rural property; professional responsibilities of valuers; RICS Valuation Practice Statements and Guidance Notes (the Red Book); Valuation Reports; Professional liability. Current research in valuation. Problem formulation in valuation. Behavioural characteristics of valuation practice, the anchoring and adjustment heuristic.
- Rural estate taxation (including income tax, Capital Gains Tax and Value Added Tax). Inheritance Tax, rural estates and the use of trusts. Taxation and the national heritage.
- Compulsory purchase powers and compensation; exercise of powers, legal basis, authorisation to entry; Compensation for land taken, retained land, severance and injurious affection, disturbance. Agricultural and other tenants. Compensation for depreciation where no land is taken: Part One and McCarthy (section 10) claims. Formulation, submission, negotiation and settlement of claims. Disputes and the role of the Lands Tribunal
Rural Asset Strategy and Management (CH002)

Credit Value: 15
Pre-requisites: Farm Business Management, Rural Professional Practice, Valuation Principles and Practice, Taxation, Introduction to Business for Rural Chartered Surveyors

Rationale and Context:
The process of business and development planning for rural property has developed along similar lines to the study of strategy in recent years. Students on this module will therefore evaluate current thinking in strategic management with a view to its application to rural property management. The management of development and change depends on the manager’s ability to manage colleagues and others. In adverse conditions the skills demanded may need to be of a high order. Students will also therefore consider the HRM dimension of strategic management in terms of people management and development policies. The module will therefore build on earlier studies in Personal Development, Introduction to Business, Farm Business Management, Rural Professional Practice, Valuation and Taxation.

Intended Learning Outcomes:
1. Analyse the strategic environment of a rural land-based business or other organisation
2. Formulate a strategic, corporate or business plan for a rural land-based business or other organisation
3. Critically evaluate strategy from a range of organisational, environmental and operational perspectives.

Indicative Content:
- **Management objectives in rural land management**: types of landholding and owner; long, medium and short-term objectives. Land tenure and its impact on strategy.
Rural Business Opportunities (RH001)

Credit Value: 15
Pre-requisites: The Farm Business, Farm Business Management

Rationale and Context:
The redeployment of basic agricultural resources away from mainstream agricultural production and towards alternative, and in some cases, more financially rewarding uses has been a long-term trend. Current EU and UK policies are encouraging this move towards non-farming diversification as an adaptation to the new environment of EU enlargement and economic globalisation. Such diversification activities often require the acquisition and application of a range of skills less familiar to food producers, such as market research, promotion, advertising and awareness of the legal context. An understanding of diversification options, as well as the range of skills, awareness and business planning techniques involved is therefore essential for the effective management of rural business opportunities.

In addition land-use issues and the statutory planning process can significantly influence the decision-taking in the rural business environment and knowledge of them is vital to the rural land manager and entrepreneur. The module therefore provides a grounding in town and country planning.

Intended Learning Outcomes:

1. Critically evaluate the economic and policy context for the increasing focus on non-agricultural diversification.
2. Develop awareness of the nature, range and contribution of diversification activities.
3. Evaluate basic farm resources with respect to diversification opportunities, and appreciate the areas of business planning needed for effective implementation.
4. Formulate effective business plans for diversification activities to be successful.
5. Assess the legal and administrative framework and rationale of planning and assess the implications of planning policies for rural business
6. Determine whether planning permission or other authorisation for works or activities is required and seek the necessary consents.

Indicative Content:

- **Sustainability and economic globalisation** – implications for agriculture.
- **The nature and role of farm diversification** activities. Diversification as a market-led adjustment in farm resource use.
- **Business planning**: Appraisal of resources: identifying diversification options; elements of effective diversification planning; techniques required for diversification planning.
- **The legal and administrative framework of town & country planning.** The role, nature and status of Government planning guidance and local Development Plans in the planning process; planning and its relationship to rural business and agriculture.
- **Development control**: the UCO and the GPDO; planning applications; planning conditions and planning obligations; planning appeals; Environmental Impact Assessment; advertisement control; conservation areas and listed buildings; National Parks and designated areas.
Rural Leisure and Diversification (RH010)

Credit Value: 15
Pre-requisites: Farm Business Management

Rationale and Context:
Diversification has recently been a major source of additional income, or in some cases the major income to the rural economy or farm enterprise. Also leisure events have increased significantly as a source of diversification and need to be seen in tandem in the future. The aim of this module is to provide an understanding and ability to appraise and recommend new business enterprises in the rural economy.

Intended Learning Outcomes:
1. To identify, evaluate and appraise the main types of diversification in the rural economy.
2. To be able to produce business plans for some of these enterprises.
3. To evaluate and market a typical event in the countryside.

Indicative Content:
- **Identify the most popular forms** of business diversification/new business start-up in rural areas and on rural estates and recognise their relative economic importance to the rural economy.
- **Evaluate the key factors** affecting the birth, growth and long-term survival of small businesses established in remote and accessible rural areas.
- **Appraise the physical, financial and human resources** of a business/estate with respect to a range of diversification opportunities.
- **Formulate a comprehensive business plan** for a diversification enterprise or a new business opportunity, including budgets and cashflows and an assessment of the effect of the proposal on any existing enterprises.
- **Formulate a marketing and implementation strategy** for an event (concert, show, fair, rally etc.) on a farm or rural estate, with full details of budgeting and resourcing.
- **Evaluate the sustainability of an event** or new business enterprise with respect to the immediate site and surrounding local area.
- **Global/EU/National policy** relating to Rural Leisure/Diversification in particular and the countryside in general.
Sustainable Energy for the Rural Estate (R6001)

Credit Value: 15
Pre-requisites: None

Rationale and Context:
Concerns about the sustainability of fossil fuels with their inherent greenhouse gas impacts, finite reserves and vulnerable supply chain have led people to consider whether there are more sustainable alternatives and to look at ways in which scarce, expensive energy supplies can be used more efficiently. This module examines both these issues in the context of the rural estate, exploring its energy production potential and the scope to reduce its energy consumption.

Intended Learning Outcomes:
1) Review policies, legislation and technological advances affecting energy supply and energy conservation on the rural estate;
2) Evaluate the efficacy of energy produced from a variety of renewable resources to cost effectively minimise greenhouse gas emissions within a case study development;
3) Analyse the economic, environmental and social sustainability of a renewable energy or a low carbon building project on a farm or estate.

Indicative Content:
- Alternative renewable energy sources for the rural estate: basic energy production principles for photovoltaics, wind turbines, hydro-electric power, anaerobic digesters, combined heat and power plants. Efficiency, cost effectiveness, environmental impact and application of these energy technologies in a rural estate environment.
- Energy crops for fuel / bio fuel: market opportunities, production and processing of crops for biomass and the production of bio fuels including miscanthus and short rotation coppice for biomass, oilseed rape for biodiesel and cereals / sugar beet for ethanol. Potential to use these fuels to provide energy on rural estate.
- Principles of sustainable building design: Site choice and potential, selection of materials, optimising energy use and thermal performance, water conservation, sustainable waste management, enhancing the indoor environment (ventilation and moisture control, maximising natural light, maintaining even temperatures).
- Sustainable refurbishment and conversion of existing buildings: Constraints of traditional building design and materials, opportunities to implement sustainable building design principles when refurbishing or converting traditional buildings. Cost effectiveness of introducing renewable energy technologies into old rather than new buildings. Case studies showing good practice.
Sustainable Forestry and Forestry Products (RH023)

Credit Value: 15
Pre-requisites: Woodland Management or Woodland and Country / Field Sports Management

Rationale and Content:
Forestry and forest products have an increasingly significant role in the management of land and in contributing to sustainable development.

This module is designed to give students a comprehensive understanding of forest management policy and practice in the UK. It will also provide an overview of global forestry issues and a sound understanding of both traditional and contemporary products and services sourced from forests.

Students completing the module will be able to evaluate different approaches to silviculture and forest management in terms of the products / services supplied and the economic, social and environmental implications of the processes adopted.

Intended Learning Outcomes:
1. Analyse conventional and innovative approaches to silviculture and forest management and the products / services they create or sustain.
2. Evaluate the costs, benefits and regulatory implications associated with modern forest management.
3. Appraise the major policy and operational issues that influence UK forest management.
4. Evaluate the major patterns of global timber and wood product markets and the factors that influence them.
5. Critically evaluate the role of forests and forest management in contributing to sustainable development at local, national and global levels.

Indicative Content:

Silvicultural systems
- Critical analysis of the economic, environmental and social performance of different forms of silviculture in the UK.

Forest management policy and practice in the UK
- UK, national and regional policy frameworks.
- Regulation of forestry and support mechanisms.
- The UK commitment to sustainable forestry.
- Certification of forest management and products.
- Management planning for forestry.

Forest products and services
- Traditional and engineered timber and wood products – production, key characteristics and applications.
- Forestry and its contribution to climate change and renewable energy.
- Non-timber products and services - sport and recreation, access, landscape, biodiversity, health, wellbeing and social inclusion.

Global forestry issues
- Timber as a globally-traded commodity, trade and market patterns and key influencing factors.
- Global forest policy.
Sustainable Systems (RH016)

Credit Value: 15
Pre-requisites: Environmental Quality & Protection or similar module

Rationale and Context:
Sustainable development involves the effective protection of the environment but also recognises the need for social progress and economic growth. Hence if the economic development of rural land is to continue it will be necessary to find sustainable solutions to the environmental pressures arising from land use practices. This module will concentrate on scientific and technological approaches to problem solving, for example in the improvement of environmental quality with time as measured by sustainability indicators, and allows the student to show the core skills required for managing in a sustainable manner i.e. analysing options and making choices. Environmental quality may be measured by a reduction in pollution to an ‘acceptable’ level, maintenance of biodiversity, careful use of non-renewable resources and the maintenance of the productive capacity of the soil.

This module will revisit the some of the environmental issues raised in earlier pre-requisite modules e.g. Environmental Protection & Quality, and seek to develop solutions that will allow sustainability ‘targets’ to be met. The student will also study the concept of integrated land management as a holistic approach to managing resources in an environmentally sensitive manner whilst maintaining profitability.

Intended Learning Outcomes:
1. Analyse the options for achieving sustainability targets and choose appropriate solutions.
2. Synthesise integrated land use systems for specific agro-ecosystems e.g. conservation of environmental features, sustaining natural resources, game conservation
3. Evaluate the relationship between integrated approaches to land management, such as IPM, and Sustainable Land Use Systems and apply these concepts to a land based business.

Indicative Content:
- Improvement in environmental quality: Sustainability indicators relating to the protection of the environment and prudent use of natural resources, environmental standards and targets. Scientific and technological approaches to meeting targets relating to nutrient losses and management practices, emissions to the atmosphere, climate change, pesticide use, energy use and soil protection.
- Sustainable land use systems: Integrated land management, principles of ICM and IPM, assurance schemes and traceability in the food chain. The value of natural eco-systems (e.g. field margins, beetle banks, etc) in pest control management, implications of agri-environmental schemes and set-aside.