

University Education in Ranch Management

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The Rural Landscape Institute

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Purpose and Scope of the Report

This report will examine the current state of university education for ranch management on the undergraduate and graduate (master's) level. The report will assess and offer an opinion whether current university education is equipping its ranch management students with the skills and knowledge required of ranch managers in the 21st century.

The report was written by request of the Rural Landscape Institute (formerly the Cook Center for Sustainable Agriculture in the American West). As such, it is directed to the Rural Landscape Institute.

Twenty-three universities (including one university-affiliated program) in seventeen states in the West were reviewed. These are:

1. Arizona: Arizona State University
University of Arizona
2. California: University of California – Davis
California State Polytechnic University – San
Luis Obispo
3. Colorado: Colorado State University
4. Idaho: University of Idaho
5. Kansas: Kansas State University
6. Montana; Montana State University - Bozeman
7. Nebraska: University of Nebraska - Lincoln
8. Nevada: University of Nevada - Reno
9. New Mexico: New Mexico State University
10. North Dakota: North Dakota State University
11. Oklahoma: Oklahoma State University
12. Oregon: Oregon State University
Eastern Oregon University
13. South Dakota: South Dakota State University
14. Texas: Texas A&M University
Texas A&M University – Kingsville
Texas Christian University
King Ranch Institute for Ranch Management
15. Utah: Utah State University
16. Washington: Washington State University
17. Wyoming: University of Wyoming

Notes on each of these universities appear in Appendix D.

Methodology

To address the adequacy of university education, a list of tasks performed by ranch managers was developed. Skills and knowledge required to address these tasks were then identified. University programs were then reviewed to assess whether their courses of instruction are geared toward developing skills and knowledge needed by today's ranch managers.

University review was done via Internet. Any information gleaned about a particular program in a particular university was affected by the content and navigability of the university's website. As can be expected, some websites are better than others. In some cases, further research, via telephone and/or personal visits to a particular campus, would be in order.

It is not presumed that the skills and tasks identified are complete, but they are by-and-large representative of what can be expected of a ranch manager. At the time of this writing, a survey to identify what this skill-set and knowledge-base should be is in the final stages of being developed but has not yet been circulated. Therefore, at this writing, this report offers the author's opinion only and has not been corroborated by a broader audience. When the results of the survey are received and tabulated, a more definitive opinion can be rendered.

Tasks and Skills Required for Ranch Management

Managing ranches involves a number of tasks. These tasks are broadly classified as business management, which includes budgeting, marketing, personnel management, bookkeeping, record keeping, writing and implementing operations plans, working with professionals and the public, representing the ranch, livestock and grazing management, machinery and infrastructure maintenance, etc. (A more complete list of a ranch manager's tasks appears in Appendix A).

Certain skills or attributes are required to perform these tasks well. Among these are communication (oral and written), leadership, the ability to manage and motivate employees, analytical and strategic thinking, creativity, open-mindedness, good work ethic, ability to set challenging and achievable goals, knowledge about how to do myriad tasks required in ranch work, computer literacy, etc. Integrity is of the utmost importance. (An expanded list of skills and attributes appears in Appendix B).

A certain knowledge base is also required. The ranch manager must know the basics of livestock care and handling, livestock nutrition, range management, mechanics, equipment and infrastructure maintenance, fisheries and wildlife habitat, crop production, forestry, weed management, horsemanship, etc. (An expanded, though by no means complete, list of a basic knowledge for a ranch manager appears in Appendix C).

Some of these skills and knowledge are learned or developed in the classroom, some are learned or developed with job experience, and most are developed through a combination of classroom instruction and on-the-job training. Some cannot be taught, but may be improved through life experience and proper instruction.

The premise behind this report is twofold:

1. A course of instruction by a university is an efficient means to develop some of these skills and some of the required knowledge.
2. Current courses of instruction in ranch management training are not addressing the skills and knowledge needed by today's ranch managers as well as they might.

Ranch Manager and Ranch Foreman

Delineation can be made between degrees, or levels, of ranch management. There are three basic levels:

1. Ranch foreman. A hand's-on manager who plans, leads, and does daily work activities, including fencing, irrigating, livestock movement, haying, facility maintenance, mechanical repair, etc. Responsibilities include developing and implementing weekly work plans, timely communication with the ranch owner or manager, and employee management (hiring, firing, motivating, and supervising). The ranch foreman works for an owner or ranch manager who is responsible for general business management.
2. Ranch manager. Responsible for general business management, including developing personnel policies, marketing, budgeting, annual ranch operations plans, bookkeeping, enterprise analysis, etc. Depending on the size of the ranch and the scope of its activities, the ranch manager may participate in, and be responsible for, certain daily or seasonal hands-on ranch work. There are several levels, or roles, a ranch manager can fill depending on the ranch managed:
 - a. Manage a ranch for an absentee owner.
 - b. Manage a ranch for the family, of which the ranch manager is a member.
 - c. Manage a ranch for himself/herself as owner.

Although the responsibilities vary with each of these roles, for the purposes of this report they will be lumped together under the title of "ranch manager."

3. Working ranch manager. On some ranches, the manager fills the role of foreman and manager. This may be the case with smaller ranches owned by absentee owners, or smaller ranches owned by the working ranch manager.

As will be discussed, an undergraduate degree in ranch management best suits the ranch manager. A certificate of ranch management may be more appropriate for the ranch foreman.

Assessment – Bachelor of Science Degree

In general, the universities reviewed offer course work that addresses the knowledge and skills ranch managers require. These courses are found across a wide array of departments, including business, math, agricultural economics, animal science, fishery and wildlife biology, English, communication, plant sciences, environmental sciences, philosophy, ecology, and others.

Generally speaking, the universities reviewed offer the right selection of courses. In the event that they don't, an appropriate course could be developed with existing resources and faculty. In some cases, elements of two or more existing courses could be blended to develop a course that would better fit a ranch management program.

Ranch management is a complicated affair. The breadth of knowledge and skills required to be a top ranch manager is staggering. As such, it is difficult at best to fit the needed knowledge, skill development, and experience into a four-year curriculum. This will require the assimilation of some courses, making some existing courses more general, dropping courses that are interesting but not useful, and adding courses that will better equip the student with skills he/she will use. It also requires access to on-going continual-education opportunities throughout the career of the ranch manager. Universities, university extension service, and private organizations provide many opportunities for continuing education.

Although the course selection in the universities reviewed tends to be quite good, almost without exception the coursework is not packaged into a program tailored to developing managers for today's ranches. For instance, ranch management programs tend to be housed in a department of agricultural economics, and consequently require too much course work in economics. As such, the ranch management programs lose sight of their product (ranch manager rather than economist) and what best serves that product (exposure to many disciplines and developing critical-thinking skills), rather than how that product serves the department (higher enrollment in economics classes).

In broad terms, a ranch manager program would be better served by replacing some economics classes with classes from other disciplines. For instance, some of the most problematic issues in business management are personnel management and conflict resolution. At a minimum ranch management students should have some exposure to

these issues, and hopefully develop some tools to equip them to deal with personnel issues and conflict resolution when they arise.

In addition, classes in philosophy or other fields in liberal arts that challenge the student to think broadly, deeply, and creatively, and to articulate those thoughts in written and spoken form, help to develop skills that will apply knowledge learned in other courses. Quality instruction is critically important for this type of course to work well. Many universities require this type of study in their core curricula, but if a student is to develop critical-thinking and communication skills to be used throughout a career, more of this type of course work is needed.

One of the key elements of good business management is the ability to assimilate information, often in fields in which the manager has only a passing familiarity, which is often contradictory, digest it, evaluate it, form an opinion, defend the opinion, and implement a decision based on that opinion. Although knowledge of different subject areas is valuable if not essential, ultimately critical-thinking skills are required to make well-reasoned decisions. A course of study should teach the student of ranch management to learn and to adapt, to seek and to question, and to develop workable solutions to challenging problems.

Ranch management programs, or its cousins agribusiness and agricultural economics, place too little emphasis on developing these critical-thinking skills. The university core curriculum requirements lead the student in the right direction but do not go far enough. Ranches in the 21st century, particularly those in scenic landscapes that house fish, wildlife, forests and grasslands, are evolving to something beyond the production of agricultural commodities – that “something” involves a much greater value placed on the natural order. The challenge to management is to operate a profitable enterprise on a landscape that complements that order. To stay abreast of, if not to lead, this trend, ranch managers must see the big picture, formulate goals, and challenge the status quo with operations plans tailored to a particular ranch – all within the context of a larger order.

More classes should be structured as seminars. A challenge of today’s ranch managers is to continually educate, and at times re-educate, themselves about how ranches should operate, what the tasks should be, and how those tasks should be done. This requires continual learning, which is often self-directed. To equip students for life-long learning, and to hone written and spoken communication skills, a seminar format that requires students to teach themselves so they can teach others by discussion and debate is invaluable. As such, students learn to be responsible for their own education and how to educate themselves.

One or more seminars with a case study format could be invaluable. Case studies presenting students with different ranch management problems could be good vehicles to teach problem-solving skills. Some programs offer capstone classes that do this – students write business plans for a ranch enterprise or enterprises tailored to a specific property within the confines of goals set by the ranch owners and the resources and

attributes of that property. This is about as close to real-life ranch management as a classroom can be.

Assessment – Certificate of Ranch Management

A university program geared toward training ranch foremen would focus on knowledge needed for basic ranch operations. Information about ranching fundamentals like animal reproduction, animal health and nutrition, principles and practices of range management, horsemanship and equine management, basic computer literacy, fundamentals of ranch record keeping, marketing, management of fisheries and wildlife habitat, etc., should teach students cutting-edge practices in the “how-to’s” of ranching. Exposure to an array of hands-on practitioners could be particularly informative.

Because ranch foremen supervise employees and report to managers, foremen must have skills in communication, personnel management, and leadership. Any program in ranch management should include in its curriculum course work to develop these skills.

The program offered by Texas Christian University (TCU), which offers a Certificate of Ranch Management with a tightly-constructed nine-month period of study, is exemplary. This program might be improved if it expanded to a twelve-month period of study, or from two semesters to three, to include course work mentioned above (communication, personnel management, leadership) that its current curriculum does not cover. University Extension personnel might be used as faculty for particular segments of certain courses.

Information on TCU’s program for a Certificate of Ranch Management appears in Appendix E.

Graduate Study

Many of the university programs reviewed offer Master of Science degrees in Agricultural Economics or in Agribusiness, or some combination of the two. These programs are designed for students who wish to pursue careers in corporate agribusiness or academia.

The King Ranch Institute for Ranch Management, affiliated with Texas A&M – Kingsville, is the exception. Like the undergraduate degree and certificate programs at TCU, this program is designed for the student whose chosen career is ranch management.

The KRIRM program emphasizes business skills (accounting, finance, management, marketing), wildlife habitat and management, animal science, and agribusiness (lecture,

laboratories, and field problems). According to its website, the Institute gears its curriculum toward teaching its students “to see the big picture” and to become familiar with, and presumably comfortable with, managing ranches in all their complexities.

The Institute uses the King Ranch, as well as other large ranches, to provide “applied teaching laboratories” for hands-on education. The Institute collaborates with the Caesar Kleberg Wildlife Research Institute as a laboratory to study wildlife management.

Like the TCU program, the program offered by KRIRM is exemplary. Information about the KRIRM appears in Appendix F.

Options for a Proposed Curriculum in Ranch Management at Montana State University

To address the needs of education for ranch management in today’s world, two options are currently envisioned. One would drop some course requirements and add others, and would redesign some courses to combine elements from two or more courses currently offered. In a sense, this option shuffles parts within the box, so to speak, rather than redesigning the box.

The other option involves redesigning the box. It would offer two programs:

- A Certificate of Ranch Management, similar to the certificate program at TCU
- A Bachelor of Science degree in Ranch Management, which would add a course of study to develop managerial and critical-thinking skills to the Certificate of Ranch Management.

Option One – Redefining Course Requirements

As discussed previously, more attention needs to be given to courses that will develop skills more appropriate for managers than those required by current undergraduate programs. In a generic sense, undergraduate programs focus more on training extension personnel or staff for agribusiness rather than managers of ranches. For a degree or certificate in ranch management, the focus must be on educating managers. As such, as mentioned previously, too much emphasis has been placed on economics and not enough on communications and critical-thinking skills. The proposed curriculum addresses this largely within the framework of courses currently offered by the university. This proposed curriculum is shown in Appendices K and L.

To add courses while keeping the credits required for a degree at 122 (MSU requires 120, TCU requires 122), some courses currently required were dropped. In other cases, courses were combined. The focus of any change was to provide a course of

study that would best educate today's ranch managers while staying within parameters provided (122 total credits for a B.S. degree). When courses were combined, it was done with the idea that in many cases some courses went into a depth of study that exceeded the knowledge managers use or require. For instance, it is unlikely that a ranch manager needs a semester-long course in soils, but some knowledge of soils is required. In this case, the current course in soils (Soil Resource) was combined with Principles in Rangeland Management to give the manager the basics he/she should know. In another case, Economics of Agricultural Policy was dropped since it is not directly applicable to skills or knowledge needed for ranch management.

By combining two courses currently required and dropping another currently required, credits were made available to add courses not currently required that should be. For instance, given the changing nature of agriculture's labor force, managers should be somewhat conversant in Spanish. Therefore, the proposed curriculum allows for one-year of Spanish (six credits). Combining two courses and dropping a third (per the example in the preceding paragraph) allowed the addition of six credits of Spanish. Obviously, if a student demonstrated proficiency in Spanish, he/she would not be subject to this requirement.

In other cases, courses that would be useful but could be acquired outside of a university curriculum were dropped. If one assumes that a ranch manager should understand the basics of horsemanship and equitation, these skills can be learned at any number of clinics. A course to satisfy this was therefore not required.

Option Two: Redefining Education in Ranch Management

This option is based on ranch management education at TCU, which includes a Certificate of Ranch Management and a B.S. in Ranch Management. At TCU, the certificate program consists of two semesters with a prescribed curriculum, which includes extensive field trips, for a total of 34 credits earned over a nine-month period. Applications are made to the Ranch Management Program.

To earn a B.S. in Ranch Management, students must complete the certificate program, the core curriculum requirements of the university, and the course requirements for a minor in General Business. TCU requires its B.S. candidates to complete the university's core requirements prior to applying to the certificate program. Application for the B.S. program is through TCU admissions.

A fundamental difference between this program and that presented in Option One is the delineation made between foreman and ranch manager. The certificate seems tailored to the student whose career interest is daily hands-on ranch operations, who directs a small labor force, or who works under the supervision of a ranch owner or manager. For the student who is charged with larger managerial responsibilities, such as

supervising a large labor force or managing all legal, financial, and business affairs of a ranch, the B.S. in Ranch Management would be more appropriate.

TCU's certificate and degree programs could be improved and adjusted to MSU. Suggested adjustments or changes include the following:

- Include blocks of one to three days to allow experts outside of MSU to conduct workshops for all certificate students. For example, Dave Pratt of Ranching for Profit could offer a three-day short-course to introduce students to his approach to ranch management. Other experts, like Fred Provenza from Utah State University, could offer a short course in two to three days on animal behavior and forage selection. These types of workshops would expose students to resources beyond the university, and to a broader array of instructors than are currently available at MSU.
- Field trips to ranches and other agricultural operations in Montana and other states. Assuming cooperation from owners of the ranches listed here, a menu of field trips could include:
 - The Flying D Ranch (Montana) to study bison management, and the relationship and interrelationship of the ranch with its local community; students would be exposed to goals for management of a large and scenic ranch by a wealthy non-resident landowner
 - The Deseret Ranch (Utah) to study low-input livestock management, wildlife habitat and commercial hunting
 - The Padlock Ranch (Montana and Wyoming) to study a large, multi-faceted, family ranching corporation
 - Small, local, natural and organic beef producers
 - Winners of the Environmental Stewardship Award presented by the National Cattlemen's Beef Association (several regional and national award winners are in Montana and neighboring states)
 - Cooperative groups working together to resolve land-use issues, like the Devil's Kitchen Working Group (Montana)
 - Montana Legend (Red Lodge), a meat processing and marketing company for all natural, Montana-raised Angus beef
- Expand the nine-month course to ten months, with the tenth month an intensive course in Spanish, or language immersion program living and working with Hispanic agricultural workers who speak no or very little English.

Depending on demand, it may be practical to offer the certificate program every other year rather than annually.

To earn a B.S. in Ranch Management, the subject material learned in the certificate program should be extended, or complemented. In a sense, the "building" (knowledge and skills) should be made larger, or expanded to accommodate more uses, with a B.S. degree in Ranch Management. With its B.S. degree, TCU appears to construct a

“separate building” rather than “expanding the building” it already constructed. By housing its certificate and B.S. degrees in separate entities (Ranch Management Program for the certificate, TCU for the degree), and requiring university standard fare for B.S. course requirements, it misses the opportunity to “finish” the undergraduate education of its students in ranch management.

Appendix L shows how the “expanded” approach might work. These are the same courses that appear in Appendix K, but organized by subject area with credits divided between the certificate program and B.S. degree.

Like TCU’s certificate program and B.S. degree, a total of 122 credits was used, with 38 of these for the certificate and an additional 84 for the B.S. degree if a one-month language intensive program is used in the certificate program. If the certificate program is nine-months, then the language credits would be picked up in the degree program, for a split of 34 and 88.

In many cases, a three-credit course would be split between the certificate and B.S. programs. In all cases where a split was made, the smaller fraction was assigned to the certificate program due to its focus on fundamentals only. That is, a ranch foreman should be familiar with income and cash flow statements, but should not be expected to prepare balance sheets and depreciation schedules, whereas a manager might be expected to do so and should be expected to understand them. The certificate gives the student a working knowledge of the basics, and the B.S. degree builds on those basics. Therefore, one credit earned in the certificate program requires two additional credits in that specific discipline to earn the B.S. degree.

It is recognized that some practical considerations emerge when splitting one course of three credits into two courses, one of one credit (Certificate) and one of two credits (B.S. degree). The point is, some basics need to be covered in the certificate program, and recognition needs to be given to that by assignment of credits. Also, in the upper-level, or follow-up course offered in the degree program, recognition needs to be given to basics learned in the certificate program. Course material may need to be combined to make full use of credit hours available during a semester.

Some coursework would be entirely covered in the certificate program. This is the case when a working manager implements that area of knowledge. Livestock nutrition and range management are examples of these. Chemistry, while not essential for day-to-day ranch operations, is useful for understanding livestock nutrition, fertilizer and soils and can help the manager understand and evaluate information presented by nutritionists and fertilizer salesmen. Chemistry is therefore recommended for the manager while it is not required of the foreman.

In general, the certificate covers subjects with an eye towards practical application of ranch management, and the degree augments this with more understanding of theory behind the practice, and with skill development in critical thinking, management, and communications.

Other Ranch Manager Training Programs

A number of education programs are available to ranch managers. These take the form of short courses, seminars and workshops and are offered by a variety of private, for-profit organizations, and by organizations affiliated with universities. In all cases, the courses offered are not designed for the comprehensive education for ranch managers. Rather, their intent is to cover narrow subjects in a short period of time. As such, these offerings are designed to augment the education and skills of working ranch managers.

Programs offered by private, for-profit entities tend to be expensive, particularly with transportation and lodging are added to tuition. Programs offered by groups affiliated with universities can have tuition that is quite reasonable, but this is not always the case.

Programs affiliated with universities include:

- BEHAVE (Behavioral Education for Human, Animal, Vegetation, and Ecosystem Management), taught by Fred Provenza of Utah State University
- The Executive Program for Agricultural Producers (TEPAP) at Texas A&M University
- The Institute of Ranch Management at TCU

BEHAVE is relatively inexpensive, and is designed to teach livestock managers how to teach their livestock to eat plants (weeds) they normally don't eat. As such, it is a specialized area of study.

The TEPAP program at Texas A&M is designed for ranch management professionals who have a substantial amount of expertise and want more exposure in certain areas of their education or training. Hence the name "Executive." Two Units of a week long each are offered at a price of \$3,500 each.

The Institute for Ranch Management is designed to offer opportunities for continuing education to the "ranching community and industry professionals," including the graduates of TCU's Ranch Management Program. According to its website, the Institute "plans and organizes ten or more continuing education opportunities per year." These events are offered for a fee designed to pay the direct costs of a particular offering. As such, the courses are probably reasonably priced.

Private entities include:

- The American Society of Farm Managers and Rural Appraisers
- Bud Williams Stockmanship and Marketing Schools
- Cattle-Fax
- Ferguson Group
- Holistic Management International

- Land EKG (Charlie Orchard)
- The Land Institute
- Ranch Management Consultants (Ranching for Profit)
- Society for Range Management

The American Society of Farm Managers and Rural Appraisers (Denver) offers a series of courses relevant to farm management for members and non-members alike. Its courses include Principles of Farm Management, Communication for Agricultural Professionals, Economics of Farm Management, and Advanced Farm Management. Their courses are designed to certify rural appraisers and farm managers who belong to the American Society. As such, they are intended to augment experience of appraisers and professional farm managers who manage farms in the Midwest. Tuition for the 38-hour Principles of Farm Management course is \$675, not including lodging or transportation.

Bud Williams (Bowie, Texas) teaches a stockmanship school for low-stress livestock handling, and a marketing workshop to teach his approach to buying and selling cattle. These courses have been popular among ranchers in the western states, but like others mentioned in this report are designed to augment skills of the practitioner. As such, they are most effectively used by those who work in livestock enterprises.

Courses offered by Cattle-Fax (Englewood, Colorado) are termed Corporate Colleges and Risk Management Seminars. These are geared to managers in agribusiness and ranching who are involved in buying and selling cattle.

Billing itself as “the United States’ premier specialist in agriculturally oriented business and financial management,” the Ferguson Group has offices in a number of states, with its office in Billings being the furthest west. In addition to consulting services, the Group offers “highly specialized” training programs from one to six days long. Its courses are tailored to farmers, lenders, and managers in senior and middle management in agriculture. As a for-profit entity catering to executive management, its courses are likely expensive and are not directed to ranchers.

Holistic Management International (Albuquerque) offers a wide array of courses. Like course offerings by other organizations, quality of material and instruction tend to be quite good, and are intended for the working ranch manager. Course work addresses land planning, grazing planning, financial planning, biological monitoring, and other subjects. As such, the courses are best used to augment or broaden the skills of practicing ranch managers. Cost per course is advertised as equivalent to “the price of a used pickup,” and tend to be relatively expensive.

Land EKG (Bozeman) offers courses to teach grazing managers how to monitor range conditions. Information gleaned from the monitoring process is used to direct grazing practices to improve range conditions. This course serves one specific purpose, which is to help land managers become better grass managers. As such, it is most useful for those responsible for developing grazing plans for pasture lands.

The Land Institute (Salina, Kansas) offers a short course with the goal to equip farmers with knowledge needed to shift agriculture from monocultures of annual grain crops to perennial grain crops grown in fields with diverse plant composition. The goal is a sustainable agriculture which will produce grain yields needed to feed a growing human population. The target audience is undergraduate students who are looking for direction in their undergraduate studies. The course is based in science and is narrowly focused, and may influence goals and practices of interested farmers. It is not intended to teach students how to manage ranches.

Ranch Management Consultants (Fairfield, California), also known as Ranching for Profit after its flagship course, describes itself as “The Business School of the Livestock Industry.” Its weeklong course covers many aspects of business, livestock, and grazing management. It offers a follow-up program, called Executive Link, to provide the framework for the graduates of its Ranching for Profit school to implement what they learned in the school. The school and its follow-up program are expensive (\$1995 for the weeklong school, and \$2495 per business per year for Executive Link – neither price includes lodging and transportation). Ranching for Profit is geared to active ranch managers.

Rather than offering courses of its own, the Society for Range Management (Wheat Ridge, Colorado) refers its members to courses offered by a wide array of entities to sharpen their range management skills. It offers a professional review process to certify qualified applicants as Range Management Consultants. Although useful for many ranchers, its course referrals are not meant to train ranch managers.

Though not exhaustive, the course offerings discussed above represent education opportunities beyond a university curriculum. To varying degrees all are designed to expand or deepen skills used by ranch managers. None are designed to be a comprehensive course in ranch management. The instruction available here would be best used within the context of, or follow-up to, a university education, whether that education is a Certificate or B.S. degree in ranch management.

Summary

In conclusion:

- Management of ranches in the 21st century requires a complex set of skills and knowledge
- The nature of those skills and that knowledge varies with the duties of the manager
- A ranch manager may take the form of:

- Foreman who reports to a supervising manager or owner
 - Manager of a family-owned ranch, of which the manager is a member
 - Manager of a ranch owned by an entity separate from the manager
 - Manager of a ranch owned by the manager
 - Foreman and manager (working manager) in the same role
- Skills and knowledge are learned through experience and through instruction in an academic environment, some of which are better learned in one format than in another
 - The skills and knowledge which are learned in an academic environment are not adequately addressed by most academic programs as currently constructed
 - A Certificate of Ranch Management:
 - Would be a nine- to ten-month intensive program with a hands-on component, extensive field trips, and make some use of instructors from private organizations
 - Would be a more appropriate academic education for ranch foreman
 - Would be integral to a B.S. degree in Ranch Management
 - The certificate program at Texas Christian University can be used as a template for a certificate program at Montana State University
 - A Bachelor of Science degree in Ranch Management:
 - Would be more appropriate for managers charged with overall business administration
 - Would focus more on developing skills in critical-thinking, communication, personnel management and business administration, and less on training economists
 - Would build on skills and knowledge learned in a certificate program
 - The graduate program offered by the King Ranch Institute for Ranch Management is exemplary for graduate study in ranch management
 - Continuing education opportunities:
 - Are abundant and generally quite good
 - Are best used to complement experience
 - Tend to cover specialized areas of study
 - Are geared toward active ranch employees, foreman and managers
 - Can be expensive

APPENDIX A

Tasks of ranch manager

- Writes annual budget; monthly expense and revenue reports; monitor budget monthly and adjust expenses as needed; annual cash-flow plan updated monthly; annual operations plan in conjunction with budget that outlines projects to be completed
- Marketing – sell livestock and other ranch commodities, products and services
- Manage ranch employees – lead, motivate, supervise, teach, discipline when appropriate, hire and fire
- Bookkeeping, whether in-house or by contract (do or supervise)
- Work with accountants, lawyers, government agency personnel as required for ranch management or planning
- Work with NGOs as need be
- Work with fishermen and hunters as needed if the public is allowed access to fish and hunt
- Spokesperson for the ranch
- Purchase decisions – machinery, feed, vehicles, tools, supplies, herbicides, fertilizer, seed, parts, appliances, bulls, cows, horses, etc.
- Record keeping – grazing, farming, irrigating, livestock production (weights, birth and death numbers, etc.), stock counts
- Annual plans: stockflow, grazing, drought, capital expenditure, feed, stocking, farming, operations/work-plans, livestock health, etc.
- Deal with salesmen
- Conduct performance appraisals of ranch personnel in a manner that is constructive for the employee and beneficial to the ranch
- Capital expenditure recommendations
- Write reports and maintain records in timely manner, including: government agency reports, budget reports, updates to owner on ranch activities; grazing reports; maintenance logs for ranch vehicles and equipment; livestock and hay inventories; wildlife harvest reports
- General ranch work, to be done in a workman-like manner that demonstrates leadership
- Ranch planning – short- and long-term
- Set goals that are achievable and realistic, that are directed by the ranch mission statement, and are consistent with the ranch operations plan
- Strategic planning – select appropriate enterprise mix given ranch resources and owner's goals
- Set realistic and challenging performance targets for ranch operations, livestock, and individual personnel
- Range monitoring
- General livestock management, including reproduction rates, weaning weights, herd health
- Supervise and participate in ranch work, including haying, irrigating, feeding, farming, fence and corral maintenance and construction, maintenance of buildings and improvements, livestock movement, branding, weed control, etc.
- If the ranch manager is the owner, draft a mission statement

APPENDIX B

Menu of skills and attributes desired in a ranch manager

- Communication – oral and written
- High integrity
- Honest
- Reliable
- Leadership – not afraid to implement new, and perhaps unpopular, ideas
- Strategic thinking – vision
- Open minded – receptive to new ideas, but able to apply what is appropriate and reject or modify what is not appropriate
- Good judgment
- Good work ethic – diligent, punctual, gets work done on time
- Ability to delegate responsibility and authority when appropriate
- Ability to accept and give direction
- Knows what he/she doesn't know, and where to look to find what he/she needs to know – a degree of humility and self-knowledge
- Planning skills -- ability to plan and assign resources – set realistic yet challenging schedules to complete assigned tasks in a timely manner
- Time management skills
- Ability to supervise, motivate and lead employees, and manage employee performance – including disciplining employees when appropriate
- Ability to set, and manage for, short and long term goals that are reasonable, achievable, and challenging
- Ability to make decisions, sometimes concerning difficult or complex situations, and sometimes under pressure, that are sound, well reasoned and timely
- Respectful of, and able to work with, a wide array of people with different interests
- Life-long learner
- Ethical, including a good land ethic
- Approachable, likeable
- Receptive to new ideas and constructive criticism
- Willingness to use and learn from consultants
- Ability to listen
- Ability to anticipate – think ahead and plan – set up contingencies
- Ability to engender trust with employees, suppliers, buyers, employer, etc.
- Open, direct, honest, straightforward communication on a timely manner with ranch owner
- Well-versed in all phases of ranch operations, including: livestock handling and management; horsemanship; range and crop management; repair and maintenance of facilities, vehicles and equipment
- Ability to teach or mentor
- Passion about ranching
- Ability to speak in front of and to groups of people

- Ability to present data or suggestions or rationale clearly and concisely
- Efficient and effective
- Good time management
- Office management – filing, paper flow
- Tidy, neat, keeps the facilities and grounds in good repair
- Ability to identify, hire and retain desirable employees
- Loyal
- Digest new ideas – critique and reshape

APPENDIX C

Basic Knowledge

Each category or discipline is learned, or can be learned, in academics or by experience. In practice, each is learned in both. For the purpose of this report, the “x” indicates the primary, or more efficient, place of learning. Experience includes workshops outside of university academics.

	<u>Academic</u>	<u>Experience</u>
• Business law	X	
• Accounting & bookkeeping	X	
• Animal nutrition	X	
• Budgeting		X
• Soils – fertilizer	X	
• Range management		
○ Grazing systems	X	
○ How to use livestock to improve range	X	
○ Botany	X	
• Wildlife habitat requirements	X	
• Horsemanship		X
• Livestock handling skills (low stress)		X
• Mechanics		X
• Agronomy	X	
• Farming – haying, cropping, irrigating		X
• Fish and fisheries	X	
• Computer skills	X	
• Forestry and timber management	X	
• Stockwater developments		X
• Fence and corral construction and maintenance		X
• Noxious weed control and management		X
• Marketing, from local to global	X	
• Risk management		
○ Hedging, futures, options, insurance	X	
• Meats	X	
• Animal science		
○ Reproduction	X	
• Genetics	X	
• Map reading		X
• Operate heavy equipment		X
• Financial management		
○ Investments	X	
○ Preparing documents for bank loan	X	
• General carpentry and metal work		X
• Business management	X	

	<u>Academic</u>	<u>Experience</u>
• Personnel management	x	
• “Soft” knowledge – interpersonal skills		x
• Spanish	x	

APPENDIX D

Notes regarding university programs

Arizona State University (ASU)

- Good core courses in agribusiness, similar to other agribusiness programs.
- Offers a B.S. in Agribusiness with a number of concentrations, including Agribusiness Finance and General Agribusiness.
- The catalog states: “The academic programs in Agribusiness are *especially* designed to meet the needs of the urban student who has little or no previous agriculture experience.” (Italics are mine)
 - There is no concentration in ranch management
 - As such, ASU does not offer a program designed to train ranch managers for the 21st century
- ASU offers a M.S. degree in Agribusiness with a concentration in Agribusiness Management and Marketing – geared toward the agribusiness firm and corporate agriculture.
- No ranch management program at ASU.

University of Arizona (UA)

- B.S. in Agribusiness Economics and Management.
- B.S. in Agricultural and Resource Economics.
- M.S. in Agricultural and Resource Economics.
- Not geared toward ranch management.

University of California – Davis (UC-Davis)

- Offers a B. S. degree in Agricultural Management and Rangeland Resources.
- Geared to California crop production rather than ranch management.
- Probably not the place to look to develop a model program that would be appropriate to ranch management in Montana and surrounding states.

California State Polytechnic University – San Luis Obispo (Cal Poly)

- Similar program as that offered by other universities, with similar strengths and weaknesses.
- Offers a B.S. in Agribusiness with a Farm and Ranch concentration

- Noteworthy courses:
 - Environmental ethics, PHIL 340
 - Human dimensions in natural resources management, FNR 323
 - Conflict management in natural resources, FNR 335
 - Organic agriculture, AG 315
 - Holistic management, AG 360
 - Applied holistic management, AG 450
 - Advanced beef cattle systems management, ASCI 311
- Offers a M.S. degree in Agribusiness, and an M.B.A. with a specialization in Agribusiness. Both of these degrees are likely better suited for corporate agriculture than they are for ranch management.

Colorado State University (CSU)

- Offers a B.S degree in Agricultural Economics with a Farm and Ranch Management Concentration.
- The core curriculum is similar to other degrees in agribusiness or agricultural economics.
- Too much emphasis on economics – academic knowledge the ranch manager will never use.
- Offers a M.S. and a Ph.D. in Agricultural and Resource Economics
- Offers a M.Agr. (Master of Agriculture)

University of Idaho (UI)

- No ranch management program –one course in Farm and Agribusiness Management (AgEc 278).
- Offers a B.S. in Agricultural Economics with a major in agribusiness.
- Offers a M.S. in Agricultural Economics.

Kansas State University (K State)

- Offers a Farm Management Option for a B. S. degree in Agricultural Economics.
- Similar to other programs examined – basically, too much emphasis on economics and not enough on analytical, communication, management, and problem-solving skills.
- In rough terms, the basic course requirements for the Farm Management Option are, in subject area followed by number of courses required in that subject area: writing 2, math 2, agricultural economics 10, public speaking 1, psychology 1, natural science 2, sociology 1, humanities 3, animal science 2, English 1,

computer science 1, marketing 1, finance 1, management 1, accounting 1, soils 1, agricultural electives 4, statistics 1.

- The Department of Agricultural Economics at K State offers a M.S., a Master of Agribusiness (M.A.B.), and a Ph.D. None are designed for ranch managers.

Montana State University (MSU)

- Offers a B. S. in Agricultural Business with a Farm and Ranch Management Option.
- Similar program as that offered by other universities, with similar strengths (good foundation of knowledge) and weaknesses (lack of “big picture” seminars, too much economics).
- Notable courses include:
 - Leadership development for agribusiness and industry employees, AGED 251 – includes goal setting
 - Leadership in business organizations, MGMT 402
 - Holistic thought and management, LRES 421
- Offers a M. S. degree in Applied Economics – with the exception of a few courses, not pertinent to ranch management.

University of Nebraska (UNL)

A good curriculum in agribusiness, but too much emphasis on economics with nine economics courses required – typical of all agribusiness programs reviewed, the department appears preoccupied with its own discipline and loses sight of what the end product needs to be.

Agricultural Economics offers a B.S. degree with a Farm and Ranch Management option

- Good course material, but too much emphasis on sciences and economics – not enough in ethics, wildlife and fisheries, range management, problem solving, communications, leadership, creative and analytical thinking skills
- Five courses in economics required

Agribusiness offers a:

- General Option
- Marketing Option

Good agriculture-related departments with wide course selection, yet each department is geared toward training experts in its particular field – no program here for the generalist, which a ranch manager needs to be.

Combine courses from agricultural economics, range, wildlife and fisheries, liberal arts, etc., to create a program that provides general knowledge, management skills, communication skills, critical-thinking skills, etc.

Could come close to sculpting a ranch manager program through the “grazing livestock systems” major – change some “agriculture/natural resources/business” electives to logic, ethics, case study seminar, etc.

Offers a B.S. in Agricultural Science with majors (among others) in:

- Agribusiness
- Animal Science
- Grazing Livestock Systems

Offers a B.S. in Natural Resources, with majors (among others) in:

- Environmental Soil Science
- Environmental Studies
- Fisheries and Wildlife
- Natural Resources and Environmental Economics
- Rangeland Ecosystems
- Water Science

Again, everything is here, but not in the right package

Offers M.S. degrees in:

- Agricultural Economics
- Animal Science
- Natural Resource Sciences

Offers a M.Ag. in Agriculture

University of Nevada – Reno (UNR)

- Departments in the College of Agriculture, Biotechnology, and Natural Resources:
 - Animal Biotechnology
 - Biochemistry
 - Natural Resources and Environmental Sciences, with majors in:
 - Environmental Science
 - Forest and Rangeland Management
 - Wildlife Ecology and Conservation
 - Nutrition
 - Resource Economics, with degrees in:
 - Agricultural and Applied Economics
 - Environmental Policy Analysis

- Offers a B.S. in Agricultural and Applied Economics.
- Does not offer a Master's degree in an agricultural discipline.
- The Department of Resource Economics does offer a course in Farm and Ranch Business Analysis (211), but the college of agriculture has no ranch management program, or a degree with a concentration in ranch management.

New Mexico State University (NMSU)

- Basically the same as other B.S. degrees in agricultural economics.
- Some good courses here, and they do offer a ranch management option, but it is geared toward production agriculture rather than picking enterprises best suited to the resources of the particular ranch, the goals of the owner, and how the two can mesh. It lacks emphasis on leadership and personnel management.
- No emphasis on critical thinking in terms of viewing ranches and their operation as tools to an improved ecology within the context of profitable enterprises.
- Offers graduate degrees geared to production agriculture (Master of Agriculture with a specialization in Agribusiness), rather than developing skills to effectively and creatively manage ranches.

North Dakota State University (NDSU)

Offers a B.S. in Agribusiness, but does not offer a ranch management option.

Requires a three-credit internship.

Like all the university programs in agribusiness:

- A good core curriculum re: exposure to broad range of fundamentals, but too heavy on economics (four courses) and statistics (two courses), and too light on courses that examine agriculture's place in a changing world
 - For instance, add a course in holistic resource management which considers a ranch's place in the community – why ranches are important and how they can be operated to contribute to the broader social, economic, and ecological good
- Couldn't locate "required core" but assumed to be similar with that of other universities with requirements in communication, humanities, etc.
- No case study seminars on management issues, developing ranch management plan
- No requirement for habitat development and management for wildlife and fisheries
- Needs courses in business law, goal setting and strategic planning, budgeting, team building, leadership, etc.

A graduate degree (M.S.) is offered in Agribusiness and Applied Economics: “The Applied Economics area emphasizes course work in economic theory, research methods, and quantitative techniques. The option is designed to prepare students for careers in agricultural economics research in private and public sectors and for Ph. D. programs at other institutions.”

- That is, no graduate degree is offered that has particular relevance to managing a ranch

Oklahoma State University (OK State)

- A very good selection of courses, but not an integrated program for training and educating ranch managers.
- Offers a B.S. in Agribusiness with a Farm and Ranch Management option
 - This presumably involves a core curriculum with agricultural economics, math, composition, chemistry, etc., but with flexibility to take more animal science and soils courses than an agribusiness major would
- Offers a M.S. in Agricultural Economics.
- (One of the poorer web sites – not easy to find information).

Oregon State University (OSU)

- A parallel curriculum for an agribusiness management major is offered at **Eastern Oregon University (EOU)**, with the degree granted by OSU.
- Departments in rangeland ecology and management, fisheries and wildlife, crop and soil science, animal sciences, environmental sciences, genetics, natural resources, and others.
- Offers a B.S. in Agricultural Business Management
 - Offers an Agribusiness Management option
- Offers a M.S. in Resource and Environmental Economics
- Offers a concentration in Agricultural Economics
- No course offering for ranch management, and no courses in farm and ranch management were found.

South Dakota State University (SDSU)

Good course selection in agribusiness, economics, range management, wildlife habitat management, animal science, etc.

- A lot of good course content, including courses in ranch management, but no integrated program for training and educating ranch managers

B.S. degrees offered in:

- Agricultural Business
- Agricultural Resource Economics
- Animal Science
- Environmental Management
- General Agriculture
- Range Science
- Wildlife and Fisheries Sciences

Like other universities, the courses are here, just not assembled in a format designed to educate ranch managers for today's world. The vision to drive the program outside of a particular department, and the bias of that department, is lacking.

Without reviewing all liberal arts departments at SDSU, it can be assumed that the pieces are here but the whole is not.

Offers M.S. degrees in:

- Animal Sciences
- Economics with emphasis in:
 - Agricultural Business
 - Agricultural Economics
- Wildlife and Fisheries Sciences
 - "Program Description: Department research, and therefore graduate research education, is usually directed toward: 1) wildlife-fisheries-agriculture interactions, 2) wetlands, or 3) biostress."

Texas A&M University (A&M)

- Offers a B.S. in Agricultural Economics with a Farm and Ranch Management option.
- Big and impersonal, a program a big university would offer.
- Just course work – builds knowledge blocks rather than ability to think critically and strategically, unless a student can gather these skills from a few liberal arts courses.
- Only one seminar, and it is for one credit.
- No emphasis on internships or practical application.
- Leans towards minutia like many agribusiness programs – loses focus on its end product and what the student needs – as though they do that which they habitually do, rather than what an evolving marketplace needs.
- Nothing on business management, personnel management, money management, leadership development, team building skills, etc.
- Offers a M.A.B. degree (Master of Agribusiness) – geared toward quantitative analysis for corporate agriculture.

Texas A&M University – Kingsville (A&M-K)

- Offers a B.S. in Agriculture with majors in:
 - Agribusiness
 - Range and Wildlife Management with a Range option
- Offers a M.S. in Agriculture with a major in Agribusiness.
- The KRIRM is affiliated with this university

Texas Christian University (TCU)

Offers a B.S. degree in Ranch Management – requires fulfilling the university core requirements (63 credits), completing a General Business minor for non-business majors (18 credits), and completing the curriculum required for the Certificate of Ranch Management (34 credits), for a total of 115 credits. Total credits required to graduate is 122, which allows the student to take an additional 7 credits in course work not specified here.

A practical, relevant, ambitious, well thought-out and well-constructed program of study for a certificate in ranch management – this program deserves serious consideration as a template in how a certificate program should be constructed.

The certificate is designed to be completed in nine months. Its target market is primarily ranch foremen. The B.S. degree would be appropriate for ranch managers.

A compelling mission statement addressing the needs of ranch management in a dynamic world:

“To prepare students as lifelong learners to manage a wide range of resources anywhere in the world on an ecologically and economically sound basis for continuing maximum net return while conserving and improving the resources. The Program provides a strong background in applicable principles and practices to cope with rapidly changing conditions precipitated by instant communication, rapid transportation, and technology that doubles every ten years or less. There is a strong effort to go beyond the presentation of facts to understanding and interrelationships, the ability to apply knowledge, and the ability to discover new knowledge where none or not enough presently exists.”

“The emphasis of the Ranch Management Program is on practical and economic results with curriculum developed from ranching professionals who understand the necessity of combining academic training with practical experience.”

The core curriculum and general business requirements are similar to those of other universities. What separates TCU are its mission, vision, and values statements, and its commitment to structure its academic requirements to do what it says it will do. Its stated mission is: “To educate individuals to think and act as ethical leaders and

responsible citizens in the global community.” Their vision statement mentions leadership development.

The required areas of study for a B.S. degree include the following, with some credits allowed to overlap between required fields of study:

- Three credits each in religions traditions, historical traditions, literary traditions, cultural awareness, global awareness, citizenship and social values, fine arts, mathematical reasoning, and oral communication
- Nine credits each in humanities and social sciences
- Six credits in natural sciences
- Twelve credits in written communication

TCU has done a credible job of outlining a course of study that will develop the analytical and communications skills required of managers.

The ranch management curriculum covers basic information in a format that is well designed for managing ranch operations. It combines material often available through two courses (nutrition and feeding, for instance), and adds course work in practical, need-to-know areas like ranch records, basic veterinary skills, USDA assistance, estate planning, weed control, etc. Extensive field trips are structured to meet with hands-on ranch managers.

For the B.S. degree it may need one or more seminars in case study of business management issues

- Personnel management (leadership, hiring and firing, compensation, conflict resolution)
- Addressing the ranch’s place in society with ranches filling larger roles than production agriculture

The ranch management curriculum is regimented – all courses are required, class hours are 9:00 AM to 4:00 PM with an hour for lunch, five days a week. Field trips include five trips of a week-long each, as well as shorter trips. Attendance in class and on field trips is mandatory. Students must comply with a dress code.

In addition, ten or more short courses, seminars or speakers are offered annually for continuing education.

The class is limited to 36 students. Current enrollment is 20. TCU has more demand for its graduates in ranch management than they have slots for students.

- “The program’s increasing success over the past several years is reflected by the fact they receive more advertised job openings for their graduates than the number of students participating in the program.” Western Livestock Journal, 1/9/06

King Ranch Institute for Ranch Management (KRIRM)

Graduate study only.

Offers a M.S degree in Agribusiness from Texas A&M University – Kingsville.

Broad focus on wildlife management and the big picture.

Good practical application with access to the King Ranch, Kleberg Wildlife Research Institute, and other large working ranches.

Lots of individual attention – currently four students.

Deserves a serious look for a graduate program or certificate for ranch management on the undergraduate level.

The KRIRM understands its purpose in equipping students to manage ranches in the 21st century, and does a very good job in addressing that purpose with its curriculum.

KRIRM's Vision:

“We are determined to educate leaders who will make a positive difference in ranching, and ensure that our hard earned heritage is not lost.”

KRIRM's Mission:

“We aspire to be a focal point for the training of graduate students in a unique and multi-disciplinary, systems approach to ranch management. We want to teach our students how to manage ranches, but we also want to teach them how to progressively think their way through to success and innovation for the industry.”

KRIRM's Core Values:

“At the King Ranch Institute for Ranch Management, open and honest communication is part of our doctrine. We partner for each student's advantage, utilizing the vast resources available to us through some of the most dedicated people in the ranching industry and some of the largest, most well-known ranches in the country. We build upon the basics in the industry, and promote innovation in the field of ranch management education. Common sense is fundamental, but we also encourage students to think beyond the ordinary. We emphasize a strong work ethic and the development of character, and strive to create an environment that helps students be creative and enjoy learning.”

Utah State University (USU)

- All the courses are here, just not packaged properly.
- No ranch management option – one course offered in “farm and ranch planning and analysis.”
- Offers B.S. in Agribusiness.
- The College of Agriculture offers M.S. degrees in:
 - Animal Science
 - Applied Economics
 - Economics
 - Ecology
- The College of Natural Resources offers M.S. degrees in:
 - Ecology
 - Fisheries Biology
 - Range Science
 - Wildlife Biology
 - Natural Resources
- Supporting programs include wildlife science, soil & water science, rangeland resources, human resource management, forestry, fisheries & aquatic sciences, finance, environmental studies, conservation & restoration ecology, and animal science.
- No program in ranch management.

Washington State University (WSU)

- No program for ranch management.
- Currently offers two courses in ranch management: Introduction to Farm and Ranch Management (Ag Ec 340), and Advanced Farm and Ranch Management (Ag Ec 440).
- Offers B.S. degrees in:
 - Agribusiness Economics and Management
 - Agricultural Economics and Management
 - Agriculture
- Supporting departments with animal science, soil science, natural resources.
- Offers a M.S. degree in Agriculture.
- Offers a M.A. degree in Applied Economics.

University of Wyoming (UWy)

- Offers a B.S degree in Agricultural and Applied Economics with a Farm and Ranch Management option.

- Too much emphasis on economics, and not enough on business management and interpersonal skills.
- Needs seminars on business management, developing ranch business plans with a wildlife component, ethics, personnel management, leadership, etc.
- Offers a M.S. degree in Agricultural and Applied Economics with a concentration in Farm and Ranch Management – could not download course offerings.
- Pretty much standard fare – a good background in academics, but light on developing skills in goal-setting, good judgment, business management, conflict resolution, personal management, critical thinking.

APPENDIX E

Ranch Management Program at Texas Christian University

TCU Ranch Management prepares individuals to be lifelong learners and professionals who manage a broad range of resources anywhere in the world on an ecologically and economically sound basis by providing a strong background in applicable principles and practices to capitalize on rapidly changing conditions in a global market. Our intensive approach goes beyond the presentation of facts to an understanding and ability to discover and apply knowledge to achieve a sustainable optimum net return while conserving and improving resources."

The Ranch Management Program at TCU provides professional training to meet the challenges of the dynamic and rapidly changing careers associated with agricultural resource management.

In the past several decades, career opportunities for agricultural resource managers have rapidly expanded to include not only ranch management but such diverse areas including commodity investment, agricultural marketing, and international agricultural trade.

Technological changes, worldwide marketing and production practices offer virtually unlimited challenges and rewards to the professional who is prepared to help shape the future of agricultural asset management.

The emphasis of the Ranch Management Program is on practical and economic results with curriculum developed from ranching professionals who understand the necessity of combining academic training with practical experience.

The Ranch Management Program requires an academic year (nine months) to complete, and students are provided intensive classroom instruction in basic management principles.

The course of study includes livestock production, natural resource conservation, forage production, accounting principles, marketing, personnel management and general management principles, and field work which is coordinated with classroom study to illustrate principles as they are applied in production situations.

Classes are presented in three-hour units to allow concentration of subject matter and to facilitate field work.

Generally, class hours are from 9 a.m. to 12 noon and 1 p.m. to 4 p.m. five days a week, although class hours may vary somewhat when field work requires additional time for travel.

The course of study is intense, and a substantial amount of material is covered in a short period of time.

The curriculum is comprised of classes that cover the basic fundamentals of a range of concerns, from physical labor to the complexity of professional management.

Basic vocational skills are taught that require physical mobility and manual dexterity.

Classroom time is dedicated to management principles that will enable the graduate to appraise representative situations, and guest lecturers who are experts in a particular field bring additional information to the students.

Field trips are an important part of ranch management education and include numerous short excursions to local agricultural operations as well as five week-long trips to operations in different geographic locations.

The visits are chosen to give the best possible cross section of different kinds of country, livestock, and operations that are representative of the ranching industry in each particular area.

The students learn climatic information, and natural resource information pertaining to soils, water, plants, wildlife, livestock, and equipment needs for the area where the operation is located.

On-site study gives the student the opportunity to learn, first hand, of the management policy currently used in breeding programs, animal health, feeding, crop production and harvesting, grazing systems, record systems, and marketing of production.

One of the more valuable aspects of field trips is the broadening of knowledge students receive from meeting successful ranchers and drawing upon their extensive skills, abilities, and experiences.

The field work also teaches students to evaluate available assets and thereby project a viable operation.

Students receive instruction in the basic skills of livestock selection, soil classification, forage evaluations, administration of medicines, and livestock handling.

During the field work, students learn to cooperate with other people and to work independently to achieve particular goals.

Travel on the field trips is conducted in University-owned vehicles equipped with two-way radios.

This communication system enables information to be exchanged among students and faculty while they are traveling between locations or traversing different resource areas.

Attendance is mandatory for all classes and field work, and students are expected to conduct themselves as the professionals they are to become and to maintain the standards of conduct, appearance and attitude that traditionally are expected within the ranching industry.

TCU Ranch Management offers four unique educational options

Certification Option: Students who wish to attend the Ranch Management Program and obtain the education that will earn them a Certificate of Ranch Management will attend classes for one academic year (nine months). This program has been available to students since 1955 and continues to serve the industry with the latest technology available. The Certificate Program in Ranch Management is not a part of other academic programs at TCU. Students in the program are required to enroll in a prescribed curriculum, and no other courses may be taken while enrolled in the program. Upon completion of the course of study, a graduate receives 34 credit hours, transferable to most colleges and universities, and a Ranch Management Certificate. Application for this program is made directly to the Ranch Management Program.

Bachelor of Science Ranch Management: Students who wish to earn a Bachelors of Science in Ranch Management may do so by completing all of the requirements as set out in the Undergraduate Studies Bulletin. The student will be required to complete the University Core Requirements prior to making formal application to the Ranch Management Program. Before beginning the junior year of studies, students will need to apply to the Program for acceptance. Qualified students will be given “conditional” acceptance into the program. They must then successfully complete the requirements for a General Business minor for non-business majors and any other requirements set forth in the admissions process. Application for the Bachelors Degree program must be through TCU Admissions.

Ranch Management Minor: Students who wish to obtain a degree from TCU in a discipline other than Ranch Management such as Business, Economics, Finance, or another field can now utilize the Ranch Management Certificate program as a minor to meet their graduation requirements provided they are qualified for admission into the program and they successfully complete the 34 hours of Ranch Management courses.

Transfer Students: Students who are in good standing at an accredited college or university and have a cumulative grade point average of at least 2.6 may be able to transfer to TCU to complete their degree by applying for acceptance into the degree program and the certificate program. This option will enable students to acquire their University Core Requirements at another institution and complete their degree at TCU. Students desiring this option should work with the Office of Admissions at TCU to assure that they are completing the required courses for acceptance into the transfer option.

Application: Applicants to the Ranch Management Program must meet all admission requirements for acceptance into Texas Christian University as set out in the Undergraduate Bulletin. Applicants should have sufficient working experience in agriculture to understand the nature of the industry. Basic knowledge and experience with an agricultural enterprise enables the student to obtain more value out of the course of study. Individuals possessing extensive experience can acquire additional knowledge and expertise through this program, which will enable them to advance their careers more rapidly. For those applicants with less experience, the program will provide a foundation of knowledge to begin a management career and to prepare them

for advancement as their level of experience increases. Applicants need to be dedicated to the profession and prepared to accept significant responsibility, while also recognizing the opportunities and challenges that exist within the ranching profession. They should also be prepared to work intensively to learn a great deal of information in a relatively short period of time. Students should be ready to accept new technology and to combine it with proven operational methods from the past to make the best use of available resources. Enrollment is limited to 36 students per year. One of the requirements for admission into either the Certificate program or the Bachelors of Science degree program of the Ranch Management Program is a personal interview, which serves to inform the applicant about the program and to answer the applicant's questions. All application requirements, including the personal interview, must be completed before a student is selected for the program.

APPENDIX F

The King Ranch Institute for Ranch Management

The birth of the King Ranch Institute for Ranch Management was to commemorate the 150th Anniversary of the King Ranch in 2003. In keeping with their long history of leadership and philanthropy, King Ranch and its family and friends decided to create and endow the King Ranch Institute for Ranch Management in collaboration with Texas A&M University-Kingsville. The program is designed for a higher level of study, and emphasizes the recruitment of mature and experienced students who can be trained for the complexities of managing large ranches today. In the fast paced and progressive world in which we now live, this program will help to ensure that ranching remains a vital part of our lives, and that ranchers will stay on the land. We believe that our students will be some of the future managers that will carry this industry into the 21st Century. They will go on to progressively manage our country's rangeland and wildlife resources, will produce livestock as part of our nation's food supply, and most importantly, will influence the lives of people on ranches and in the communities that they support. We also believe that the KRIRM will have a strong and positive impact on the ranching industry of South Texas, our nation, and even the world.

- To teach our students to see the big picture, we follow a systems approach to learning about the complex business of ranching
- To give our students outside perspective, we enhance their curriculum by using invited lectureships, an annual symposium, and other mediums
- To provide our students with hands-on experience, we use the King Ranch and other large ranches as applied teaching laboratories
- To give our students access to one of the top wildlife research centers in the world, we leverage the Caesar Kleberg Wildlife Research Institute as a model of success and a sister institute for collaboration
- To teach our students to apply what's been learned, we provide internships for them with selected ranches and use successful ranch managers as mentors

Degree Plan

The Master of Science degree through the King Ranch Institute for Ranch Management is currently offered in Agribusiness in the College of Agriculture and Human Sciences at Texas A&M University-Kingsville. This degree plan is offered for graduate research projects; the thesis plan is not necessary for this degree.

The graduate research project (or Plan II) requires the satisfactory completion of a minimum of 36 credit hours of graduate work, including a 3 credit hour special problems course that requires a research paper shorter than a thesis.

For more details, see page 79 in the College of Graduate Studies Catalog.

Graduate Course Selection List*

Business

Accounting Information Systems – ACCT 5307
Seminar in Business Finance – FINC 5331
Management Science – MGMT 5325
Seminar in Marketing – MKTG 5361

Wildlife Management

Wildlife Nutrition – WSCI 6371
Wildlife Research Methods – WSCI 6374
Biopolitics and Public Relations – WSCI 6302
Wildlife Population Ecology – WSCI 6381

Habitat Management

Rangeland Synecology – WSCI 6386
Wildlife Habitat Management – WSCI 6387

Animal Science

Physiology of Mammalian Reproduction – ANSC 5307
Environmental Physiology of Animals – ANSC 5336
Ruminant Nutrition and Physiology – ANSC 5337
Monogastric Nutrition – ANSC 5338
Statistics in Agriculture – ANSC 5390
Quantitative Genetics – ANSC 6335

Agribusiness

Advanced Studies in Agribusiness – AGBU 5390
Advanced Problems in Agribusiness – AGBU 5395

*Please note prerequisites for graduate courses listed in the College of Graduate Studies Catalog to see if you will need leveling in these areas. Courses will vary for each student.

Leveling

Because different students have stronger backgrounds in different undergraduate course subjects, individual degree plans will be customized to strengthen areas of weakness. This may require preliminary courses in those areas in addition to the required graduate level courses. It is recommended that before applying to the KRIRM, students take advantage of local academic institutions, such as community colleges or universities, to strengthen undergraduate backgrounds based on the course descriptions below. Contact Dr. Barry Dunn to discuss the best strategy for your case.

Leveling Courses

Business

General Accounting
Cost Accounting
Money and Banking
Business Finance

Principles of Operations/Production Management
Business Statistics
Mathematics for Business and Economics
Principles of Marketing

Animal Science

Animal Breeding and Genetics
Beef Cattle Production
Ruminant Nutrition
Reproductive Physiology of Domestic Animals
Animal Physiology
Anatomy and Physiology of Domestic Animals

Wildlife Management

Principles of Wildlife Management
Big Game Management
Wildlife Management Techniques

Range Management

Principles of Range Management
Range Ecology
Rangeland Plants

Lectureships

Lectureships will cover the additional topics of

- Habitat Management
- Meats
- Oil and Gas
- Legal Issues
- Current Ranching Issues
- Systems Approaches to Problem Solving

These lectureships may take the form of weekly seminars, short courses, or special one-time presentations. Students can expect at least one of each of the above listed lectureships during the 2 year degree plan.

HOLT/CAT Symposium on Excellence in Ranch Management

Students will be exposed to top industry experts as they discuss pertinent issues in ranch management. Students will also participate in the coordination and hosting of the event, which provides additional networking opportunities with symposium participants and speakers. The symposium is an annual event.

Special Courses and Training

Special courses may involve short courses at other universities, extension programs, or industry seminars. Special training may involve customized workshops to train KRIRM students in technological skills such as GPS/GIS use, modeling, or other similar topics. Students can expect up to 3 special courses during the 2 year degree plan.

APPENDIX G

Matrix Summary of Degrees Offered

<u>University</u>	<u>ASU</u>	<u>UA</u>	<u>UC Davis</u>	<u>Cal Poly</u>	<u>CSU</u>	<u>UI</u>	<u>K State</u>	<u>MSU</u>	<u>UNL</u>	<u>UNR</u>	<u>NMSU</u>
Certificate of Ranch Management											
B.S. Agricultural Economics		x (4)			x	x	x		x	x(8)	x(3a)
--Farm/Ranch Management Option					x		x		x		x
B.S. Ranch Management											
B.S. Agribusiness	x		x (2)	x	x			x	x		
--Farm/Ranch Management Option				x				x			
M.S. Agribusiness	x			x			x				x(3b)
M.S. Agricultural Economics		x			x	x	x	x(1)	x		
Internships				x							
Field trips (substantial)											

<u>University</u>	<u>NDSU</u>	<u>OK State</u>	<u>OSU</u>	<u>EOU</u>	<u>SDSU</u>	<u>A&M</u>	<u>A&M-K</u>	<u>TCU</u>	<u>KRIRM</u>	<u>USU</u>	<u>WSU</u>	<u>UWy</u>
Certificate of Ranch Management								x				
B.S. Agricultural Economics				x(6)	x	x					x(10)	x(14a)
--Farm/Ranch Management Option						x						x
B.S. Ranch Management								x				
B.S. Agribusiness	x	x	x(6)		x		x(12a)			x	x(10)	
--Farm/Ranch Management Option		x										
M.S. Agribusiness	x(13)					x	x(12b)		x			
M.S. Agricultural Economics		x	x(7)		x(5)					x(9)	x(11)	x(14b)
Internships	x								x			
Field trips (substantial)								x	x			

Note: Numbers refer to notes on the next page

Notes

1. MSU offers a M.S. in Applied Economics
2. UC Davis offers a B.S. in Agricultural Management and Rangeland Resources
- 3a. NMSU offers a B.S. in Agriculture with a major in Agricultural Economics and Agricultural Business with an option in Ranch Business Management
- 3b. NMSU offers a Master of Agriculture with a specialization in Agribusiness
4. UA offers a B.S. in Agricultural Economics and Management with options for agricultural business or agricultural economics
5. SDSU offers a M.S. in Economics with an emphasis in agricultural business or agricultural economics
6. OSU offers a B.S. in Agricultural Business Management; EOU offers a cooperative program with OSU
7. OSU offers a M.S. in Resource and Environmental Economics
8. UNR offers a B.S. in Agricultural and Applied Economics
9. USU offers a M.S. in Applied Economics
10. WSU offers a B.S. in Agribusiness Economics and Management, and a B.S. in Agricultural Economics and Management, and a B.S. in Agriculture
11. WSU offers a M.S. in Agriculture and a M.A. in Applied Economics
- 12a. A&M-K offers a B.S. in Agriculture with a major in Agribusiness and a major in Range and Wildlife Management with a Range option
- 12b. A&M-K offers a M.S. in Agriculture with a major in Agribusiness
13. NDSU offers a M.S. in Agribusiness and Applied Economics
- 14a. UWy offers a B.S. in Agricultural and Applied Economics
- 14b. UWy offers a M.S. in Agricultural and Applied Economics

APPENDIX H

University Acronyms

<u>Key</u>	<u>Acronym</u>
Arizona State University	ASU
University of Arizona	UA
University of California - Davis	UC Davis
Calif. Polytechnic State University	Cal Poly
Colorado State University	CSU
University of Idaho	UI
Kansas State University	K State
Montana State University - Bozeman	MSU
University of Nebraska - Lincoln	UNL
University of Nevada - Reno	UNR
New Mexico State University	NMSU
North Dakota State University	NDSU
Oklahoma State University	OK State
Oregon State University	OSU
Eastern Oregon University	EOU
South Dakota State University	SDSU
Texas A&M University	A&M
Texas A&M University - Kingsville	A&M-K
Texas Christian University	TCU
King Ranch Institute for Ranch Mgmt	KRIRM
Utah State University	USU
Washington State University	WAU
University of Wyoming	UWy

APPENDIX I

University Websites

<u>University</u>	<u>State</u>	<u>Acronym</u>	<u>Websites</u>
Arizona State University	AZ	ASU	http://www.poly.asu.edu/msabr/degreeprograms.htm
University of Arizona	AZ	UA	http://catalog.arizona.edu/2005-06/dept/AREC.shtml
University of California - Davis	CA	UC Davis	http://admissions.ucdavis.edu/academics/major_view.cfm?major=aamr&div=2 http://www.agecon.ucdavis.edu/
Calif. Polytechnic State University	CA	Cal Poly	http://www.calpoly.edu/~agb/ http://www.calpoly.edu/~acadprog/coursedescri2005-07.html
Colorado State University	CO	CSU	http://welcome.colostate.edu/index.asp?url=academics http://dare.agsci.colostate.edu/csuagecon/undergradprograms/docs/farmranch.pdf
University of Idaho	ID	UI	http://www.ag.uidaho.edu/ http://www.ag.uidaho.edu/aers/undergrad.htm
Kansas State University	KS	K State	http://courses.k-state.edu/catalog/undergraduate/ag/agec.html
Montana State University - Bozeman	MT	MSU	http://www.montana.edu/econ/ http://www.montana.edu/wwwcat/programs/agbu.html#FARM http://www.montana.edu/wwwcat/2002-04_public.html/courses/courses2.html http://www.montana.edu/wwwcat/programs/agbu.html
University of Nebraska - Lincoln	NE	UNL	http://casnr.unl.edu/current/051ABUSgen.pdf http://casnr.unl.edu/current/051AECNfrm.pdf http://casnr.unl.edu/index.htm

University of Nevada - Reno	NV	UNR	http://www.ag.unr.edu/cabnr/ http://www.cabnr.unr.edu/re/01
New Mexico State University	NM	NMSU	http://www.nmsu.edu/Academic_Progs/Undergraduate_Catalog_95_96/ch2/age.html
North Dakota State University	ND	NDSU	http://www.ag.ndsu.nodak.edu/colag/ag_desc.html
Oklahoma State University	OK	Ok State	http://www3.dasnr.okstate.edu/ http://agecon.okstate.edu/undergrad/agribus_major.asp
Oregon State University	OR	OSU	http://agsci.oregonstate.edu/ http://catalog.oregonstate.edu/DepartmentOverview.aspx?code=AREC
Eastern Oregon University	OR	EOU	http://www.eou.edu/catalog/agscience.html
South Dakota State University	SD	SDSU	http://econ.sdstate.edu/Academic/agbus.htm http://econ.sdstate.edu/Academic/ageccourses.htm
Texas A&M	TX	A&M	http://agecon.tamu.edu/undergraduate/curriculum/agec/frm.shtml http://agecon.tamu.edu/graduate/MAB.shtml#cohort
Texas A&M University - Kingsville	TX	A&M-K	http://www.tamuk.edu/academics/degrees_offered/ http://www.tamuk.edu/academics/
Texas Christian University	TX	TCU	http://www.ranch.tcu.edu/ http://www.tcu.edu
King Ranch Institute for Ranch Mgmt	TX	KRIRM	http://krirm.tamuk.edu/ http://krirm.tamuk.edu/curriculum.html
Utah State University	UT	USU	http://www.usu.edu/ats/majorsheets/05-06/AgEcon05.pdf
Washington State University	WA	WAU	http://www.cahe.wsu.edu/ http://academics.wsu.edu/fields/study.asp?ID=AG_B#23
University of Wyoming	WY	UWy	http://uwadmnweb.uwyo.edu/REGISTRAR/bulletin/1agagec.html http://www.uwyo.edu/uwgradbulletin/Administration/general-info/degrees-offered.html

APPENDIX J

Websites for Continuing Education

Programs Affiliated with Universities

BEHAVE (Fred Provenza, Gregg Simonds)

The Executive Program for Agricultural Producers

The Institute of Ranch Management at TCU

Website

<http://www.behave.net/index.html>

http://www.behave.net/pdf/new_cal_beh.pdf

<http://www.behave.net/people/simonds.html>

<http://tepap.tamu.edu/brochure.htm>

<http://tepap.tamu.edu/>

<http://www.ranch.tcu.edu/ranchinstitute.htm>

Private Organizations

American Society of Farm Managers and Rural Appraisers

Bud Williams Stockmanship School

Bud Williams Marketing School

Cattle-Fax

Ferguson Group

Holistic Management International

Land EKG (Charlie Orchard)

The Land Institute

Ranch Management Consultants/Ranching for Profit

Society for Range Management

Website

<http://www.asfmra.org/>

<http://stockmanship.com/>

<http://budwilliamsmarketing.com/>

<http://www.cattle-fax.com/marketing/corpcollege.html>

<http://www.fergusongroupltd.com/Education.asp>

<http://www.holisticmanagement.org/>

<http://www.landekg.com/>

<http://www.landinstitute.org/vnews/display.v/ART/1999/07/01/37e2761f3>

<http://www.ranchmanagement.com/>

<http://www.rangelands.org/srm.shtml>

APPENDIX K

Proposed Curriculum for a B.S. in Ranch Management -- Montana State University

<u>Dept</u>	<u>#</u>	<u>Suffix</u>	<u>Course Title</u>	<u>Credits</u>	<u>Course Changes</u>
BUS	221		Principles of Accounting I	3	
AGEC	321		Economics of Agricultural Marketing	3	Include futures, options, retained ownership, & global marketing.
AGEC	337		Agricultural Law	3	
AGEC	341		Farm & Ranch Management	3	
ARNR	102		Principles of Rangeland Management Lab	1	Include monitoring.
ARNR	100		Introduction to Animal Science	3	Beef, horses, sheep goats.
ARNR	316		Meat Science	4	
ARNR	456		Conflict Resolution in Natural Resource Management	1	
BIOL	103	CS	Environmental Issues & Society	3	One credit lecture, two credits seminar.
BUS	201		Managerial Communication	3	
CHEM	121	IN	Introductory General Chemistry	3	
ECON	101	IS	Economic Way of Thinking	3	
ECON	102		Principles of Macroeconomics and International Economics	3	
ENGL	121	W	College Writing I	3	
ENGL	221		College Writing II	3	
LRES	421		Holistic Thought & Management	4	Restructure to two credits lecture, two credits seminar.
MATH	105		Algebra for College Students	3	
MATH	170	Q	Survey of Calculus	4	
MLS	101		Elementary Spanish I	4	
MLS	102	D	Elementary Spanish II	4	
STAT	216	Q	Elementary Statistics	3	
		IA or RA	Select from a number of courses for Arts requirement	3	
		R	Select from any department	3	
AGEC	445		Agribusiness Management	3	Focus should be ranch management capstone class.

Combine into one course:			3	
MKTG	242	D	Introduction to Global Markets	
AGEC	210	IS	The Economics of Agricultural Business	
Combine into one course:			3	
ARNR	101		Principles of Rangeland Management	Examine different grazing models.
LRES	201		Soil Resource	
Combine into one course:			3	
ARNR	240		Principles of Natural Resource Ecology	
ARNR	345		Riparian Ecology and Management	
ARNR	353		Grazing Ecology and Management	
Combine into one course:			3	Train managers, not experts.
ARNR	321		Physiology of Reproduction	
ARNR	322		Principles of Animal Breeding and Genetics	
Combine into one course:			3	Train managers, not experts.
ARNR	434		Beef Cattle Management	
ARNR	320		Animal Nutrition	
ARNR	230		Range Livestock Production	
Combine into one course:			3	
ARNR	438		Range-Wildlife Relationships	
BIOL	447		Conservation Biology	
F&WL	301		Principles of Fish & Wildlife Management	Add elements from F&WL 201: Intro to F & W
Combine into one course:			3	
BUS/FIN	351/352		Finance/Financial Management	
AGEC	345		Agricultural Finance and Credit Analysis	
One of the following:			3	
ACCT	223		Principles of Accounting II	
BUS	222		Managerial Accounting	
One of the following:			4	Or design a course with elements from each.

AGED	251	US	Leadership Development for Agribusiness & Industry Employees	--Four credit course, lecture & seminar, and skill development exercises.
MGMT	202		Supervision & Leadership	
MGMT	366		Managerial Analysis and Action I	
MGMT	402		Leadership in Business Organizations	
MSG	103		Problem Solving and Leadership Management Skills	
MGMT	403		Human Resources Management	
One of the following:				3
CLS	101	US	College Seminar	
CLS	201	US	College Seminar	
BUS	101	US	Freshman Seminar	
One of the following:				3
MGMT	411		Computer Applications	
CS	150		Computer Literacy	
One of the following:				3
HIST	404		Montana and the West	
HIST	515		The American West	
ENGL	214	D	Regional Literature	
One of the following:				3
HIST	456		American Thought and Culture	
HIST	466		United States Environmental History	
HIST	468		Animal Histories	
HIST	206		Darwinian Revolution: Its History, Science, and Impact	
RELS	223		Nature and Culture	
One of the following:				3
LRES	110		Land Resources & Environmental Sciences	
LRES	461		Restoration Ecology	
One of the following:				3
PHIL	105	IH	Problems of Good & Evil	

PHIL	120	IH	Reason & Reality		
PHIL	231		Introduction to Logic		
UNIV	121		Ideas & Perspectives		
One of the following:				3	
PHIL	250	RH	Morality & Society		
PHIL	332		Ethics		
PHIL	340		Environmental Ethics		
MGMT	468		Business, Ethics and Environment		Change to seminar, add ag focus.
TOTAL CREDITS				<hr/> 122	
Excess credits				2	
Courses to drop				0.66666667	
Other courses to be considered:					
AGEC	345		Agricultural Finance & Credit Analysis	3	
COM	110	US	Introduction to Public Communication	3	Speaking skills should be learned in seminars.
BUS	301		Management & Organization	3	
BIOL	104	CS	Life and Other Big Questions	4	
ARNR	110		Western Equitation	2	Can get this outside of the university.

APPENDIX L

Subject and Credit Division -- Ranch Management Curriculum -- Certificate and B.S.

<u>Department</u>	<u>Subject Area</u>	<u>Credits</u>	<u>Cert. Cr.</u>	<u>B.S. Cr.</u>
Accounting				
BUS	221 Principles of Accounting I	3	1	2
	Managerial Accounting or Accounting II	3	0	3
	--one of ACCT 223 or BUS 222	6	1	5
Economics				
ECON	101 Economic Way of Thinking	3	1	2
ECON	102 Principles of Macroeconomics and International Economics	3	0	3
	Agricultural Economics and Global Markets	3	0	3
	--combine elements from AGECE 210 and MKTG 242			
AGEC	321 Economics of Agricultural Marketing	3	1	2
		12	2	10
Business Management				
AGEC	337 Agricultural Law	3	1	2
AGEC	341 Farm & Ranch Management	3	1	2
ARNR	456 Conflict Resolution in Natural Resource Management	1	0	1
LRES	421 Holistic Thought & Management	4	0	4
MLS	101 Elementary Spanish I	4	4	0
MLS	102 Elementary Spanish II	4	0	4
AGEC	445 Agribusiness Management	3	1	2
	Leadership and Personnel Management	4	1	3
	--one of MGMT 202, 366, 402, 403; AGED 251; MSG 103			
	Finance and Financial Management	3	1	2
	--combine elements of AGECE 345 with BUS 351 and FIN 352			
	Computer Applications and Literacy	3	1	2
	--CS 150 or MGMT 411	32	10	22
Communications				

BUS	201	Managerial Communication	3	1	2
ENGL	121	College Writing I	3	1	2
ENGL	221	College Writing II	3	0	3
			<hr/>	<hr/>	<hr/>
			9	2	7
Rangeland and Habitat Management					
ARNR	102	Principles of Rangeland Management Lab	1	1	0
		Principles of Rangeland Management and Soils Resource --combine elements from ARNR 101 and LRES 201	3	3	0
		Grazing and Riparian Management --combine elements from ARNR 240, 345, & 353	3	3	0
		Environmental Sciences and Restoration Ecology --LRES 110 or 461	3	0	3
			<hr/>	<hr/>	<hr/>
			10	7	3
Fish and Wildlife Management					
		Fish and Wildlife Management --combine elements from ARNR 438, BIOL 447, F&WL 301	3	3	0
Animal Science, Livestock Production and Management					
ARNR	100	Introduction to Animal Science	3	3	0
ARNR	316	Meat Science	4	4	0
		Reproduction, Breeding and Genetics --combine elements from ARNR 321 & 322	3	3	0
		Beef Cattle Management and Nutrition --combine elements from ARNR 230, 320, & 434	3	3	0
			<hr/>	<hr/>	<hr/>
			13	13	0
Liberal Arts					
BIOL	103	Environmental Issues & Society	3	0	3
		College Seminar --one of CLS 101 or 201; BUS 101	3	0	3
		Western Studies --one of HIST 404 or 515; ENGL 214	3	0	3
		Environment/Nature/Evolution --one of HIST 206, 456, 466, 468; or RELS 223	3	0	3
		Good & Evil/Reason & Reality/Logic	3	0	3

		--one of PHIL 105, 120, 231; UNIV 121			
		Ethics/Morality	3	0	3
		--one of PHIL 250, 332, 340; MGMT 468			
IA or RA		Select from a number of courses for Arts requirement	3	0	3
R		Select from any department	3	0	3
			<hr/>	<hr/>	<hr/>
			24	0	24

Sciences

CHEM	121	Introductory General Chemistry	3	0	3
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Math and Statistics

MATH	105	Algebra for College Students	3	0	3
MATH	170	Survey of Calculus	4	0	4
STAT	216	Elementary Statistics	3	0	3
			<hr/>	<hr/>	<hr/>
			10	0	10

TOTAL CREDITS

			<hr/>	<hr/>	<hr/>
			122	38	84