This outline is intended as both a teaching guide for instructors and a study guide for exam candidates. However, formal classroom study is not sufficient preparation for taking the certification exam. Work experience in an animal facility is also necessary for exam preparation, and in fact is one of the exam eligibility requirements. Ideally, work experience should include rotation through all areas of the animal facility to give the most opportunity for developing skills and knowledge related to a variety of species and work functions.

In the outline below, percentages in parentheses indicate the percentage of questions included within each of the domains of the certification exam. Topic examples listed under subdomains are not inclusive.

<table>
<thead>
<tr>
<th>I. Animal Husbandry Health and Welfare (66-92%)</th>
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<tbody>
<tr>
<td>A. Identification of animals (7-11%)</td>
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<tr>
<td>1. Species recognition</td>
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<tr>
<td>2. Strain identification</td>
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<td>3. Sex differentiation</td>
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<td>4. Identification techniques and interpretation (ear notching/punching, tattooing, microchipping)</td>
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<td>B. Species Specifics (7-11%)</td>
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<tr>
<td>1. Anatomy and physiology</td>
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<td>2. Natural habitats/environment</td>
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<td>3. Identification of normal vs abnormal characteristics</td>
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<td>C. Breeding (3-7%)</td>
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<tr>
<td>1. Housing/environmental requirements (light cycles, nestlets, nesting boxes)</td>
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<td>2. Pregnancy recognition (palpation, diagnostic tests, visual signs)</td>
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<td>3. Breeding behavior</td>
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<td>4. Basic techniques (monogamous, harem, cross fostering)</td>
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<td>5. Complications (dystocia, prolapse, retained placenta)</td>
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<td>6. Care of pregnant mother and young</td>
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<td>D. Nutrition (4-8%)</td>
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<tr>
<td>1. Food characteristics (form, textures, quality)</td>
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<td>2. Handling of food and water (dispensing, decontamination)</td>
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<tr>
<td>3. Quality control of food and water (storage, analysis, contamination, milling date)</td>
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<tr>
<td>4. Animal feeding behaviors and requirements (ground feeders, upright feeders, feed availability)</td>
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<tr>
<td>5. Food supplements (vitamins, minerals, administration, mill date)</td>
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<tr>
<td>6. Species-specific nutritional requirements</td>
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<tr>
<td>7. Water quality and delivery systems (potable water, reverse osmosis, acidification, equipment maintenance)</td>
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<td>8. Research specific dietary requirements</td>
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<td>E. Husbandry Practices (17-21%)</td>
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<tr>
<td>1. Environmental monitoring and control for macro- and microenvironment (temperature, humidity, ammonia, lighting)</td>
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<td>2. Caging types (squeeze, transport, metabolic)</td>
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<tr>
<td>3. Caging/housing materials (polycarbonate, stainless steel)</td>
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<tr>
<td>4. Species-specific housing requirements (resting boards, perches, aquatic housing)</td>
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</tbody>
</table>
5. Space requirements (cages, stalls, runs, number of animals per cage)
6. Bedding (types, amount, quality, handling, storage)
7. Special housing areas (quarantine, isolation, barrier, containment)
8. Primary enclosure and bedding change frequency (regulated and nonregulated species)
9. Ventilated racks and air filters
10. Physical restraint/handling and transportation (techniques, equipment, precautions, food/water requirements)

F. Sanitation, Disease Prevention and Control (12-16%)
   1. Sanitization agents (cleaning chemicals, disinfectants, sterilants, required concentrations)
   2. Decontamination methods and procedures (manual and mechanical methods, sterilization techniques)
   3. Pest/vermin recognition (warning signs)
   4. Personal hygiene (handwashing, showering)
   5. Aseptic techniques
   6. Containment and barrier techniques and facilities
   7. Protective equipment and clothing
   8. Biosecurity and disease prevention (animal inoculation, parasite control, sentinel program, pet ownership, disease transmission)
   9. Sterilization techniques (equipment, caging, bedding)

G. Clinical, Health and Research Procedures (4-8%)
   1. Medical/veterinary/scientific terminology
   2. Animal health considerations (signs of stress, disease, weight gain or loss, death, confirmation of death requirements)
   3. Treatment techniques (routes of administration for medications and euthanizing agents; euthanizing common lab rodents)

H. Formulas and Calculations (1-5%)
   1. Temperature conversion (Fahrenheit, Celsius)
   2. Weights and measures (pounds, ounces, milliliters, millimeters, cubic centimeters)
   3. Dilution calculations

I. Animal Welfare (7-11%)
   1. Ethical treatment of animals
   2. Federal, state, and local regulations, industry guidelines (The Guide), and institutional policies
   3. Environmental enrichment needs
   4. Public awareness (media portrayal, public perception)
   5. Acclimation period
   6. Identification of species-typical behavior vs research-induced behavior
   7. Anesthesia and analgesia (pain recognition, monitoring, equipment, species specific)

II. Facility Administration and Management (8-34%)
   A. Documentation and Record Maintenance (2-6%)
      1. Institutional Animal Care and Use Committee (IACUC) records
      2. Animal health records
      3. Regulatory records (USDA, PHS, FDA, GLP)
      4. Monitoring logs/task sheets
      5. Breeding records
   B. Data collection, Analysis and Interpretation (0-4%)
1. Data collection techniques (barcode reader, paper log, graph charts)
2. Data analysis (recognition of condition changes, such as weight gain or loss)

C. Fiscal Management (purchasing procedures and quality assurance of items received) (0-3%)
   1. Purchasing procedures
   2. Quality assurance of items received
   3. Cost recovery (census and per diems)

D. Facilities Operations and Management (0-4%)
   1. Equipment maintenance
   2. Traffic patterns (clean and dirty corridors, room care sequence)
   3. Procedures for reporting abnormal environmental parameters
   4. Inventory systems (feed, bedding, equipment)
   5. Rotation policies (rotating cages)
   6. Environmental friendly initiatives for lab animal facilities
   7. Waste disposal (procedures, regulations, documentation)
   8. Security (security systems; breach prevention, response, and reporting)
   9. Controlled substance handling and storage

E. Occupational Health and Safety (2-6%)
   1. Personal protective equipment (respirators, gloves, safety glasses)
   2. Safety equipment and procedures (fire extinguishers, alarms, bite and scratch kits, first aid)
   3. Personnel health surveillance/maintenance (serology banking, vaccinations, TB testing)
   4. Handling, storage, and disposal of hazardous waste (biohazards, chemical, radiation)
   5. Environmental hazards (warning signs, injuries, noises)
   6. Emergency procedures (evacuation plans, unexpected hazards, emergency contacts)
   7. Species-specific zoonotic risks and diseases
   8. Ergonomics (proper lifting technique, repetitive motion)

F. Employee Management and Training (0-3%)
   1. Organizational structure (chain of command, communication)
   2. Employee training and mentoring

G. Interpersonal Relations (4-8%)
   1. Communication (verbal, written, listening)
   2. Conflict resolution (grievance committee)
   3. Time management skills and coordination
   4. Institutional policies (sexual harassment, diversity awareness, violence in the workplace)
   5. Customer service skills