A. **TITLE**: Advanced Science and Technology of Behavior II

B. **COURSE NUMBER**: ABAP 485

C. **CREDIT HOURS**: 3

D. **WRITING INTENSIVE COURSE**: No

E. **COURSE LENGTH**: 15 weeks

F. **SEMESTER(S) OFFERED**: Fall or Spring

G. **HOURS OF LECTURE, LABORATORY, RECITATION, TUTORIAL, ACTIVITY**: 3 lecture hours per week

H. **CATALOG DESCRIPTION**: This second course of a two course sequence covers in detail more of the basic variables of which the behavior of humans and other animals is a function, as discovered from the natural science perspective and with the emphasis on increasingly complex human behavior. Included is not only the wide range of pertinent and accessible environment–behavior functional relations, but also the naturalistic philosophical foundations of the behaviorology discipline as well as the research methodology involved in discovering the independent variables in these relations and engineering them into sophisticated applications and interventions beneficial to humanity. Course topics include (a) multi–term contingencies, (b) function–altering stimuli, (c) stimulus equivalences, (d) reinforcement schedules plus adjunctive behavior, (e) aversive controls plus more effective alternatives, (f) applied behavior research plus behavioral objectives, (g) gradual change in both stimuli (fading) and responses (shaping), (h) some complex cases (including attitudes, values, rights, ethics, morals, and beliefs), and (i) verbal behavior. A preview of the more complex disciplinary topics of consciousness, personhood, life, culture, reality, and intellectual evolution (biological and cultural) is also part of this course.

I. **PRE-REQUISITES/CO-REQUISITES**: 
   a. Pre-requisite(s): (ABAP 385) Advanced Science and Technology of Behavior I, or permission of instructor.

   b. Co-requisite(s): none

J. **GOALS (STUDENT LEARNING OUTCOMES)**: By the end of this course, the student will be able to:

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<th>Course Objective</th>
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<tr>
<td>a. Analyze the most common multi–term contingencies, including those containing function–altering stimuli</td>
<td>1. Communication</td>
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<td>2. Crit. Thinking</td>
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<td>3. Prof. Competence</td>
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<td>4. Inter-Intrapersonal Skills</td>
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<td><strong>b.</strong> Explain stimulus equivalence and its relevance to education, verbal behavior, and other complex behaviors</td>
<td>2. Crit. Thinking  3. Prof. Competence</td>
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<td><strong>c.</strong> Evaluate aversive controls and their side effects and analyze and explain their more effective alternatives</td>
<td>1. Communication  2. Crit. Thinking  3. Prof. Competence</td>
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<td><strong>d.</strong> Emphasizing the same naturalistic perspective fundamental to all other behavior related topics, analyze and explain the complex behavior–environment relations described as attitudes, values, rights, ethics, morals, and beliefs</td>
<td>1. Communication  2. Crit. Thinking  3. Prof. Competence  4. Inter-Intrapersonal Skills</td>
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<td><strong>e.</strong> Analyze and explain in detail the many classes of verbal operants and their multiple controlling variables, including evocative and function–altering antecedents, along with their reinforcing and punishing effects and other controlling postcedents</td>
<td>1. Communication  2. Crit. Thinking  3. Prof. Competence</td>
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**K. TEXTS:**

• The remaining chapters (after ABAP 385) in General Behaviorology – The Natural Science of Human Behavior by Dr. Lawrence Fraley and Study Questions for Fraley’s General Behaviorology by Dr. James O’Heare

OR

• The remaining chapters (after ABAP 385) in Applied Behavior Analysis – Second Edition by Drs. Cooper, Heron, and Heward

• Supplemented by other books and articles as appropriate. (See the references.)

**L. REFERENCES:**


M. **EQUIPMENT:** Smart classroom

N. **GRADING METHOD:** A-F

O. **MEASUREMENT CRITERIA/METHODS:** To be determined by the instructor. Possibilities include but are not limited to:
- assigned homework completion
- research papers
- book reports
- group oral/written reports
- individual oral/written reports
- essays
- class participation
- projects
- journals
- quizzes
- tests
- exams

P. **DETAILED COURSE OUTLINE:**

I. Multiple term contingencies of reinforcement.
   A. General contingent relations.
      1. Two–term contingent relations.
      2. Three–term contingent relations.
   B. The four–term contingency.
   C. More than four–term contingent relations.
      1. To expand or not to expand.
      2. The contingency–specifying stimulus.
   D. Operant and respondent relations in multi–term contingencies.
      1. The functional intermingling of public and private events.
      2. Externalizing the analysis.
      3. Avoidance as escape.
      4. The role and economy of rules.
   E. Review of critical concepts in the analysis of complex contingencies.
      1. The concept of context.
      2. Where contextual variables produce their effects.
      3. Explaining the origin of behavior controlling relations.
      4. The utility of expanding the contingent relations.
      5. Accounting for antecedents.
      6. Fear as a punitive consequence.
      7. Real and unreal events in relation to private and public events.
      8. Why dwell on private internal events.
II. Function altering stimuli: the analysis of context.
   A. Alterations to the function of antecedent stimuli.
      1. The function–altering stimulus ($S\text{\textsuperscript{a}}$).
      2. Ambiguous phrases.
   B. The analysis of context.
      1. Context defined in terms of antecedent stimuli.
      2. Operant conditioning to strengthen an $S\text{\textsuperscript{a}}$.
      3. Identifying an elusive $S\text{\textsuperscript{a}}$.
   C. The functionality of a long deferred consequence.
      1. The analysis of a current behavior.
      2. The functional role of the deferred consequence.
   D. The function–altering role of verbal behavior.

III. Stimulus equivalence.
   A. Stimulus equivalence identified.
      1. The concept of an equivalence relation.
      2. Conditional requirements for the emergence of untrained relations.
   B. The three requisite properties of an equivalence relation.
      1. The reflexive property.
      2. The symmetric property.
      3. The transitive property.
      4. Testing for the properties.
      5. Is the emergence of an untrained relation a basic process?
   C. Confirming an equivalence relation.
   D. Expansions of the member stimulus pairs.
      1. Training for the first equivalence class.
      2. Training for the second equivalence class.
      3. Training for the anticipated merger of the two previously trained but otherwise unrelated equivalence classes.
      4. Total conditional discriminations, both trained and emergent, resulting from the merger of two distinct equivalence relations into a single large equivalence relation.
   E. The importance of equivalence relations.
   F. Four–term and five–term contingencies in analyses of equivalence relations.
   G. Discriminative and conditional control.
   H. Success and failure in stimulus equivalence training.

IV. Schedules of reinforcement.
   A. “Schedule of reinforcement” defined.
      1. Common kinds of schedules of contingent reinforcement or punishment.
      2. Definitions of terms and phrases pertinent to schedules of conseuation.
         a. Fixed Ratio (FR) examples.
         b. Variable Ratio (VR) examples.
         c. Stretching the ratio.
         d. Typical behavior patterns under FR and VR schedules.
         a. Fixed Interval (FI) examples.
         b. Variable Interval (VI) examples.
         c. Stretching / straining the interval.
d. Typical behavior patterns under FI and VI schedules.
5. Practical examples of reinforcement schedules.
6. Analytical questions for identifying the prevailing kind of schedule.
7. Sequences of differing schedules.
8. Fixed aspects of variable schedules.
9. Resistance of schedules to extinction.
10. Reinforcement schedules are among the controls on virtually all behavior, overt or covert.

B. Noncontingent reinforcement.
1. Time schedules.
2. Superstitious behavior.

C. Ratio schedules: additional characteristics and use.
1. Continuous reinforcement (CR).
2. Typical behavior pattern under the CR schedule.
3. The utility of the CR schedule.
4. Transition from CR to other schedules.
5. The rapid extinction of behavior with a history of CR.
7. Adjusting to a change from a CR to a FR schedule.
8. Stretching / straining the ratio of an FR schedule.
10. Scallops and ratio schedules.
   a. The theory of a scallop.
   b. The theory of cyclic resumption.
12. Variable Ratio schedules (VR).
13. Predicting one’s own behavior under a VR schedule.
14. Adjusting to a change from a CR to a VR schedule.
15. Stretching / straining the ratio of a VR schedule.
16. The resistance of VR schedules to extinction.

D. Social implications of the variable ratio schedule.
1. Games of chance (gambling).

E. Interval schedules: additional characteristics and uses.
1. Essential characteristics of interval schedules.
2. Scallops and interval schedules.

F. Some other basic schedules.
1. Limited Hold (LH).
2. Differential Reinforcement of Low rate (DRL).
3. Differential Reinforcement of High rate (DRH).
5. Compound schedules.

G. The DRO pseudoschedule (“Differential Reinforcement of Other” behavior).

V. Adjunctive behavior.
A. Conceptual foundations for analyzing adjunctive behavior.
1. Adjunctive behavior defined.
2. Intraschedule adjunctive behavior.
3. Repeated appearances of adjunctive behavior.
5. Sequential adjunctive behaviors.
6. Adjunctive behavior under conflicting contingencies.

B. Social implications of punishment-enabled adjunctive behavior.
C. Predicting adjunctive behaviors.
D. Selection of adjunctive behaviors.

VI. Aversive control and the alternatives.
A. The continuing debate about the analytical role of emotional effects.
   1. Discounting it.
   2. Denying it.
B. A review of the characteristics of punishment.
   1. The utility of punishment.
      a. Immediate results.
      b. Easy to arrange.
      c. Immediacy and inevitability.
      d. Reinforcing the punitive agent.
   2. The disadvantages of punishment.
      a. Tendency to recover.
      b. Recovery of rate as a function of the strength of the aversive stimulus.
      c. Adjustment to punishment.
      d. Punishment as a cultural practice.
   3. Some characteristics of punishment.
      a. Aversive stimuli: magnitude versus effect.
      b. A relation between reinforcement and punishment.
      c. Guilt, sin, shame, and anxiety.
C. Alternatives to punishment.
   1. Avoid conditioning the offending behavior.
   2. Preclusion and antecedent prevention.
   3. Eliminating the capacity of the body to behave.
      a. Drugs.
      b. Physical restraint.
      c. Surgery.
D. Extinction versus negative punishment.
   1. The distinction.
   2. Extinction.
   3. Negative punishment.
E. Analysis of complexities of negative punishment.
   1. The typical concept of negative punishment.
   2. Negative punishment by loss of a negative reinforcer.

VII. Changes in antecedent behavior–controlling relations.
A. Review of basic relations and some common interpretative fallacies.
   1. The discriminative stimulus.
   2. The $S_\Delta$.
   3. The $S_\Delta$.
      a. Adjunctive behavior and the $S_\Delta$.
      b. The function–altering stimulus and the $S_\Delta$.
      c. Can an $S_\Delta$ evoke a non–behavior?
5. Consciousness in less verbal species.
   a. Species differentiation.
   b. Species of greater consciousness.
   c. Daydreaming.

B. Habituation and potentiation.
   1. Injecting habituation and potentiation into analytical accounts of operant behavior.
   2. The importance of habituation and potentiation.
   3. Dishabituation.
   4. Underlying mechanisms.

C. Discrimination: shrinking the set of evocative stimuli.
   1. Discrimination defined.
   2. Explaining discrimination with three-term contingencies.

D. Generalization: enlarging the set of evocative stimuli.
   1. Generalization defined.
   2. Explaining generalization with three-term contingencies.

E. History accounting for instances of discrimination and generalization.

F. Relying on existing evocative relations.
   1. Modeling and imitating.
   2. Following rules.
   3. Following instructions.

G. Practical training–related issues.
   [Five issues, each with (a) solution, (b) theory, and (c) training principle:]
   1. Insufficient initial behavior.
   2. Indiscriminative behaving.
   3. Unacceptable protraction.
   4. Stimulus consistency.
   5. Inconsistent consequation.

H. Concepts.
   1. Traditional implications and definitions.
   2. The concept of “concept”.
   3. Producing a concept.
   4. Preannounced concepts.
   5. Exercises designed to produce a concept by reducing the stimulus controls on the concept content responses to the definitive set of properties.
   6. Requiring the inference of a concept.
   7. Steps toward producing a concept description as a final inference.
   8. Potential instructional difficulties when conditioning a concept.

I. The role of stimulus control in producing concepts.
   1. Distinguishing between “antecedent stimulus” and “discriminative stimulus”.
   2. The role of discrimination.
      a. The S-S and the S-S.
      b. Reducing the behavioral variations evoked by a given stimulus.
   3. The role of generalization.
      a. Stimulus generalization.
      b. Increasing the behavioral variations evoked by a given stimulus.
   4. Distinguishing between the stimulus controls on respondent and operant behavior.
5. The reality of concepts.
6. Experience and its substitute.
7. The appropriateness of certain descriptive phrases.
8. Rules for more effective and efficient training.

VIII. Introduction to Applied Behavior Research.
A. Dependent Variables.
B. The Experimental Control of Independent Variables.
   1. Variance resulting from residual uncontrolled variables.
   2. Variance indicative of experimenter ignorance and economic constraints.
C. Error introduced by measuring.
D. Levels of rigor and experimental settings.
E. Repeated measures.
F. Interpreting data.
G. Contingencies under which research is conducted.
   1. Why do research?
      a. Discovery mode.
      b. Proof mode.
      c. Test mode.
   2. The engineered production of prescribed outcomes.
H. Validity, reliability, and generality.
I. Direct versus indirect measure.
J. Experimental designs for research on behavior.
   1. The AB design.
   2. The ABA, ABAB, and BAB experimental designs.
   3. The Multiple Baseline experimental design.
      a. Informal approximation.
      b. An instruction–related variation.
   4. The Titration design.
      a. Data collection during the first phase of a titration design.
      b. Adjusting the intrinsic properties of the consequating stimulus.
K. Research implications of a traditionally assumed but absent sameness.
   1. The nature, function, and recognition of private behavior.
   2. Verifying the occurrence of private behavior.
L. The confirmation of private events.

IX. Behavioral objectives.
A. Behavioral objectives in their sociocultural context.
   1. Behavioral objectives defined.
      a. The student.
      b. The behavior.
      c. The criteria.
      d. The “givens.”
      e. The behavioral objective.
   2. Including or omitting the antecedent conditions.
   3. Instructions versus behavioral objectives.
      a. Instructions.
      b. Behavioral objectives.
   4. Principles applicable to the establishment of behavioral objectives.
      a. Who sets the objective?
b. Implications of requiring objectives for complex skills.
5. Composing a behavioral objective.
B. Complexity levels of the behavior in objectives.
C. Creative behavior defined.
D. The analysis of complex objectives.
  1. Objectives with intermingled parts.
  2. Dealing sensibly with combined objectives.
E. The importance and uses of behavioral objectives.
  1. The basis of measurement and evaluation.
  2. Gain scores.
  3. The address of skills at all levels.
  4. Behaving for the right reasons.
    a. Faulty postcedent control.
    b. Faulty antecedent control.
  5. Coordinating the students and the teachers.
F. Fluency criteria.
  1. The nature of fluency.
  3. The degree of behavior change relative to the behavioral objective.
  4. Sensitive tracking of student gains in a fluency skill.
  5. Time limit: a “given” or a criterion?
G. Objectives in the affective domain.
  1. The nature of affect.
  2. The engineering prescription for the production of “liking.”

X. Shaping procedures.
A. Shaping: refining skills.
  1. Shaping defined.
  2. The indirect contrivance of natural shaping.
  3. Producing new behaviors.
  4. Shaping and differential reinforcement.
  5. Other uses of the term “shaping”.
B. Special features of shaping procedures.
  1. Successive approximations.
  2. Mastery at each stage.
  3. Acquiring complex skills.
  5. Distinction between shaping and simple reinforcement.
  7. Shaping under intermittent reinforcement schedules.
C. Measuring progress during a shaping procedure.
D. Relations between shaping and differential reinforcement.
  1. Judgment defined.
  2. Training for good judgment.
E. Relations between shaping and behaving discriminatively.
  1. Becoming more discriminating with a single behavior.
  2. Becoming more discriminating by the divergence of a behavior–controlling relation.
  3. The role of shaping in discrimination training.
XI. The fading procedure and a review of other motivators.
   A. Procedural review: contingencies of reinforcement.
      1. Antecedent events.
      2. Postcedent events.
      3. A three-term contingency of reinforcement or punishment.
      4. The effects on a behavior of antecedent and postcedent stimulus changes.
   B. The multiple determination of behavior.
      1. Determining the function of each antecedent stimulus.
      2. Deprivation and satiation in relation to discriminative stimuli.
   C. Operant fading.
      1. Fading: procedural and/or natural.
      2. The operant fading process.
      3. The first phase of a fading procedure: why the supplementary evocative stimuli can be withdrawn.
      4. Distinguishing between supplementary stimuli and function–altering stimuli.
   D. Fading a function–altering stimulus.
      1. Eliminating the S
      2. Replacing the S
   E. Respondent fading.
   F. Prompts and probes.
      1. Distinguishing between prompts and probes.
      2. The functional role of prompts and probes.
      3. The fading of non–verbal prompts and probes.
   G. Fading to establish a generalization or a discrimination.
      1. Fading procedure that establishes a generalization.
      2. Fading procedure that establishes a discrimination.
   H. Errorless discrimination and generalization: training procedures.
   I. Verbal behavior and the fading process.
   J. Distinguishing between shaping and fading procedures.
      1. Shaping.
      2. Fading.
   K. Operant fading versus the fading of physical limits.
   L. The addition and fading of supplementary consequences.
   M. Fading and other procedures that “motivate” an organism.
      1. The traditional perspective.
      2. The natural science of motivation.
      3. Teaching strategies that motivate students.
      4. The traditional view of motivation and its implications.

XII. Attitudes, values, rights, ethics, morals, and beliefs.
   A. A natural science of privilege and propriety.
   B. Attitudes.
      1. Attitudes defined.
      2. The operant basis of an attitude.
      3. The respondent basis of an attitude.
   C. Values.
   D. Rights and ethics defined.
      1. Rights and ethics from the behaviorological perspective.
2. Rights.
3. Ethics.

E. Some sociocultural implications of rights and ethics.
   1. The exploitation of people via their own ethics.
   2. Ethical communities.
   3. Abstracted ethics.
   4. The endurance and security of rights.
   5. Rights and ethics as scientific products.

F. The construction of a conscience.

G. Pride and love.
   1. Pride.
   2. Distinguishing among pride, loving, and liking.

H. Morals: analysis and implications.
   1. Morals: definition and discussion.
   2. Cultural prohibitions on strong reinforcers.
   3. The origin of general intolerance for behavioral nonconformity.
   4. The origin of intolerance for kinds of people.

I. Belief and belief statements.

XIII. Verbal behavior.

A. Verbal behavior overview.
   1. Definition of verbal behavior.
   2. The conditioning and control of verbal behavior.
   4. Private verbal behavior.
   5. Implications for training.

B. Terminological issues.

C. The Antecedent Control of verbal behavior.
   1. The physical basis of antecedent evocation.
   2. The analysis of antecedent control.

D. How instances of verbal behavior are classified.

E. The mand.
   1. Defining the mand.
   2. The analytical resolution of the privacy problem.
   3. Analyzing the social function of mands.
   4. The motivation for manding.

F. Verbal behavior under the control of verbal stimuli.
   1. The nature of this verbal behavior class.
   2. Examples of controlling relations in this class.
   3. Conceptual instability.

G. The tact.
   1. Conditioning a tact.
   2. The stimulus control of tacts and their extensions.
   3. Abstraction.
   4. Tacts of private events.
   5. The validity of a tact.
   6. Tacts and reality.
   7. Responding to temporal relations.
   8. Responding to the nature of the controls on a tact.

H. Autoclitic verbal behavior.
1. Descriptive autoclitics.
2. Autoclitics that function as mands.
3. Qualifying autoclitics.
4. Quantifying autoclitics.
5. The autoclitic functions of grammar and syntax.
7. The progressive trend toward functional unity.
8. Composition: its nature and occurrence.
10. Autoclitic verb inflections: the subtlety of their natural controls.
11. The general role of autoclitics in verbal behavior.

I. The private verbal behavior of thinking.
   1. The issue of thought to which the thinker may remain oblivious.
      a. Forgetting.
      b. Extinction.
      c. Suppression.
   2. The productivity of thought.
   3. Analyzing the utility of thought.
   4. Issues of privacy and antiquity.

J. Maintaining reliance on function–based.
   1. Accounting for verbal and nonverbal behavior.
   2. Form versus function.
   3. The absence of thinking.
   5. The selection and control of verbal behavior.
   6. The implications of ineffective knowing.
   7. The strategic nature of the necessary intervention

Q. LABORATORY OUTLINE: No laboratory