ACE-International Exam Content Outline

INSPECTION AND IDENTIFICATION

(45% of exam)

Topic	Knowledge needed to accomplish the skill:
Inspect for evidence of pests	
	Tools available for inspection and appropriate uses (e.g., flashlight, moisture meter, flushing agents)
	Probable locations of pests
	Types of evidence of pest presence (e.g., damage caused, egg types, frass)
	Safety precautions (e.g., equipment, personnel)
Inspect for conditions conducive to pests	
	Tools available for inspection and appropriate uses (e.g., flashlight, moisture meter, flushing agents)
	Conditions conducive to pests (e.g., site, weather, ambient conditions)
	Safety precautions (e.g., equipment, personnel)
Identify pests	
	Taxonomy and classificaon
	Morphology
	Biology (basic physiology, behavior, habitat, lifecycle, reproduction potential)
	Damage caused
Document and communicate findings of pest inspection and identification	
	How to explain pest thresholds and respond to customer expectations
	Use, limitations and types of pest thresholds
	What to document
	How to document
	Where to document
	To whom to communicate findings
	Adherence to ACE Code of Ethics

Monitoring

(12% of exam)

Topic	Knowledge needed to accomplish the skill:
Identify and select appropriate monitoring tools	
	Monitoring tools available and their uses/limitations and related safety precautions (e.g., flashlight, light traps, pheromone traps)
	Pests that are most commonly monitored (cockroaches, flies, stored product pests, termites, bed bugs)
Place monitoring tools properly	
	Proper use and placement of tools
	Appropriate combined use of tools
Document and communicate findings of monitoring and recommendations	
	What to document
	How to document
	Where to document
	To whom to communicate findings and recommendations
	Application of the ACE Code of Ethics

SELECTION/IMPLEMENTATION OF CONTROL METHODS

(28% of exam)

Topic	Knowledge needed to accomplish the skill:
Choose the appropriate control method(s) for pest management	
	Cultural control options available, appropriateness of each, and advantages/limitations of each (e.g., sanitation, temperature, special lighting, habitat modification)
	Biological control options available, appropriateness of each, and advantages/limitations of each (e.g., predators, parasites, pathogens)
	Mechanical control options available, appropriateness of each, and advantages/limitations of each (e.g., traps/glueboards, pest proof design, removal, air curtains, lights)
	Chemical control options available, appropriateness of each, and advantages/limitations of each (e.g., IGRs, Pheromones/Attractants, Pesticides)
	Simple modes of action of commonly used pesticides
	Classifications of commonly used pesticides
	Pesticide resistance
	Pesticide formulations
	Pesticide application techniques
	Appropriateness (or not) of combinations of products
	Following label instructions, including disposal
	Relative effectiveness/efficacy versus risk of various control methods and options within each method
	Importance of selecting least hazardous effective method(s)/option(s)
Select the appropriate tool(s) for use with the pest management method(s) for pest scenarios	
	Tools available, appropriateness of each, and advantages/limitations of each and related safety precautions (e.g., compressed air sprayer, infrared camera, gas detector, duster)
Follow the label instructions and precautions	
	Common precautions
	Active ingredients
	Types of formulations
	Proper storage and disposal
	Concentration and mixing procedures
	Restricted use pesticides
	Trade names, common names and chemical names
	Toxic dosages
Educate the customer on their role in pest management	
	Critical messages to convey
	Appropriate methods for message conveyance
	Behavioral customer modifications
Perform selected pest control method(s)	
	Appropriate application techniques for each of the pest control methods
	Application of the ACE Code of Ethics
Document and communicate the pest control method(s) applied and tool(s) used for application	
	What to document
	How to document
	Where to document
	Application of the ACE Code of Ethics

EVALUATION

(15% of exam)

Topic	Knowledge needed to accomplish the skill:
Look for reduction in pests	
	Monitoring
	Identification
	Communication with customer
Analyze pre- and post-treatment effects	
	Acceptable thresholds
	Pest resistance
	How to analyze the presence of pests over space and time
	Managing customer expectations
	Interpreting results
Determine next steps	
	IPM process
	Methods/options available
	Use of results to affirm/modify pest management methods/options
Document and communicate evaluation findings	
	What to document
	Third party audits
	Application of the ACE Code of Ethics

Pests found on the exam

In decreasing order of likelihood to be on exam

Biting and Stinging Pests	
	Bed and bat bugs (Cimex spp.)
	Yellowjacket wasps (Vespula, Paravespula and Dolichovespula maculata (The bald faced hornet))
	Paper wasps (Polistes spp.)
	Mosquitoes (family Culicidae)
	Honey bee, (Apis mellifera)
	Black widow spiders (Latrodectus spp.)
	Brown recluse spiders (Loxosceles spp.)
	Fungus gnats (families Fungivoridae and Sciaridae)
	Blow flies (family Calliphoridae)
	Hornet (Vespa crabro)
	Cat flea (order Siphonaptera)
	Brown dog tick (Rhipicephalus sanguineus)
	American dog tick (Dermacentor variabilis)
	Scorpions (class Arachnida: order Scorpiones)
	Wolf spiders (family Lycosidae)
	Bumble bees (Bombus spp.)
	Black legged tick (Ixodes spp.)
	Solitary bees (Members of the families Apidae, Andrenidae, Megachilidae, Halictidae and Colletidae)
	Flesh flies (family Sarcophagidae)
	Mites (rodent and bird)

	Stable fly (Stomoxys calcitrans)
	Black & yellow mud dauber (Sceliphron spp.)
	Lone star tick (Amblyomma americanum)
	Sac spiders (family Miturgidae; previously Clubionidae) including Cheiracanthium
	Hobo spider and other funnel weaver spiders (family Agelenidae)
	Soft ticks (Argasidae)
	Cicada killer, (Sphecius speciosus)
	Ground spiders (family Gnaphosidae)
	Jumping spiders (family Salticidae)
	Organpipe mud dauber (Trypoxylon spp.)
	Head louse (Pediculus humanus capitis)
	Dust mites (Dermatophagoides spp.)
	Body louse (Pediculus humanus humanus)
	Crab louse (Pthirus pubis)
	Chigger mites

FLIES (ORDER DIPTERA)

	Small fruit (vinegar, pomace) flies (Drosophila spp.)
	House fly (Musca domestica) and lesser house fly (Fannia canicularis)
	Moth (drain, filter, sewer) flies (family Psychodidae)
	Phorid (humpbacked, scuttle, mausoleum) flies (family Phoridae)
	Fungus gnats (families Fungivoridae and Sciaridae)
	Blow flies (family Calliphoridae)
	Cluster flies (Pollenia rudis)
	Flesh flies (family Sarcophagidae)
	Stable fly (Stomoxys calcitrans)
	Horse and deer flies (family Tabanidae)
	Dung flies (family Scathophagidae)
	Crane flies (family Tipulidae)
	Soldier flies (family Stratiomyidae)

ANTS (FAMILY FORMICIDAE)

	Carpenter Ants (Camponotus spp.)
	Odorous house ant (Tapinoma sessile)
	Red imported fire ant (Solenopsis invicta)
	Pavement ant (Tetramorium caespitum)
	Pharaoh ant (Monomorium pharaonis)
	Argentine ant (Linepithema humile)
	Little Black Ant (Monomorium minimum)
	Acrobat Ants (Crematogaster spp.)
	Crazy ant (Paratrechina longicornis)
	Ghost Ant (Tapinoma melanocephalum)
	White Footed Ant (Technomyrmex albipes)
	Big Headed Ants (Pheidole spp.)
	Field Ants (Formica spp.)
	Harvester Ants (Pogonomyrmex spp.)

COCKROACHES (ORDER DICTYOPTERA; ALT. BLATTARIA)	
	German cockroach (*Blattella germanica*)
	Asian cockroach (*Blattella asahinai*)
	American cockroach (*Periplaneta americana*)
	Brownbanded cockroach (*Supella longipalpa*)
	Smokybrown cockroach (*Periplaneta fuliginosa*)
	Oriental cockroach (*Blatta orientalis*)
	Australian cockroach (*Periplaneta australasiae*)
	Woods cockroach (Parcoblatta spp.)
	Surinam cockroach (Pycnoscelus surinamensis) ******

STORED PRODUCT AND FABRIC PESTS	
	Indian meal moth (Plodia interpunctella)
	Cigarette and drugstore beetle (Lasioderma serricorne and Stegobium paniceum)
	Carpet/domestic beetles (Anthrenus and Attagenus spp.)
	Clothes moths
	Flour beetles (Tribolium spp.)
	Sawtoothed and merchant grain beetles (Oryzaephilus spp.)
	Warehouse & Cabinet Beetles (Trogoderma spp.)
	Psocids (Order Psocoptera)
	Rice Weevil (Sitophilus oryzae) and Corn Weevil (Sitophilus zeamais)
	Hide and larder beetles (Dermestes species)
	Angoumois Grain Moth (Sitotroga cerealella)
	Mediterranean Flour Moth (Anagasta kuehniella)
	Foreign Grain Beetle (Ahasverus advena)
	Plaster Beetles (family Lathridiidae)
	Spider beetles (family Ptinidae)
	Mealworm Beetles (Tenebrio spp.)
	Dust mites (Dermatophagoides farina)
	Bean Weevil (Acanthocelides obtectus)
	Flat Grain Beetle (Cryptolestes pusillus)
	Cowpea Weevil (Callosobruchus maculatus)
	Red Legged Ham Beetle (Necrobia rufipes)
	Cadelle (Tenebriodes mauritanicus)

WOOD DESTROYING INSECTS	
	Subterranean termites, (Reticulitermes and Coptotermes spp.)
	Carpenter ants (Camponotus spp.)
	Formosan termite, (Coptotermes formosanus)
	Carpenter bee (family Xylocopidae)
	Drywood termites (Kalotermes approximatus, Incisitermes and Cryptotermes spp.)
	Lyctid powderpost beetles
	Old house borer, (Hylotrupes bajulus)
	Anobiid beetles
	Bostrichid (false powderpost) beetles
	Long horned beetles (Cerambycidae)
	Dampwood termites (Zootermopsis and Neotermes spp.)
	Metallic wood boring beetles (family Buprestidae)

OCCASIONAL INVADERS and GENERAL HH PESTS	
	Silverfish (order Thysanura)
	Springtails (Order Collembola)
	Earwigs (Order Dermaptera)
	Brown marmorated stink bug (Halymorpha halys)
	Millipedes (Class Diplopoda)
	Centipedes (class Chilopoda)
	Box elder bug, (Boisea trivittatus)
	Sowbugs and pillbugs (class Isopoda)
	House cricket, (Acheta domesticus)
	Cellar spiders (family Pholcidae)
	Asian multicolored lady beetle (Harmonia axyridis)
	Ground Beetles (family Carabidae)
	Field cricket, (Gryllus spp.)
	Clover mite (Bryobia praetiosa)
	Firebrat (order Thysanura)
	Comb footed (cobweb) spiders (family Theridiidae)
	Camel (cave) cricket (Ceuthophilus spp.)
	Thrips (order Thysanoptera)
	Elm Leaf Beetle (Pyrrhalta luteola)
	Aquatic Insects Adults (Trichoptera, Ephemeroptera, Plecoptera)
COMMON COMMENSAL PESTS (NON-ARTHROPOD)	
	House mouse
	Norway rat
	Roof rat
	Pigeon (rock dove)
	Deer mouse
	English sparrow
	European starling
	Commensal bats (Chiroptera)